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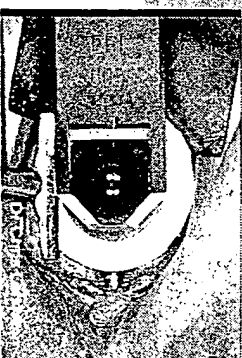
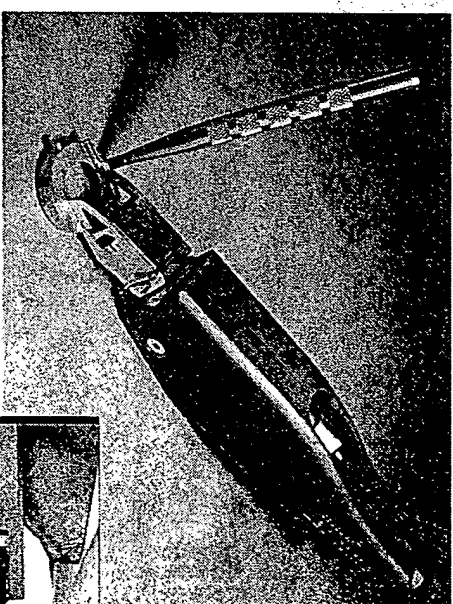
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EPI-LASIK

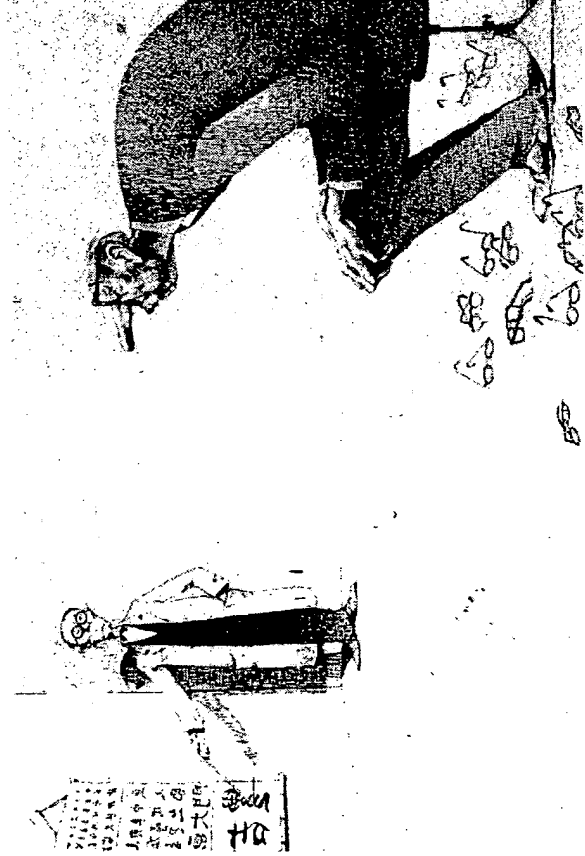
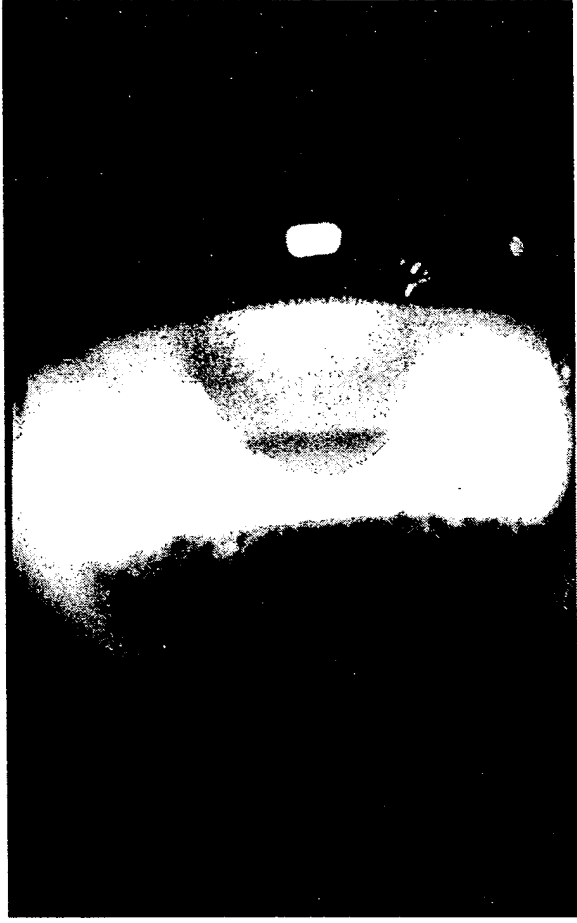
Epi-Tome®

Gebauer

Chris P Lohmann, MD, PhD
Professor of Ophthalmology
University Eye Clinic
Regensburg, Germany



QuickTime™ and a
Photo - JPEG decompressor
are needed to see this picture.

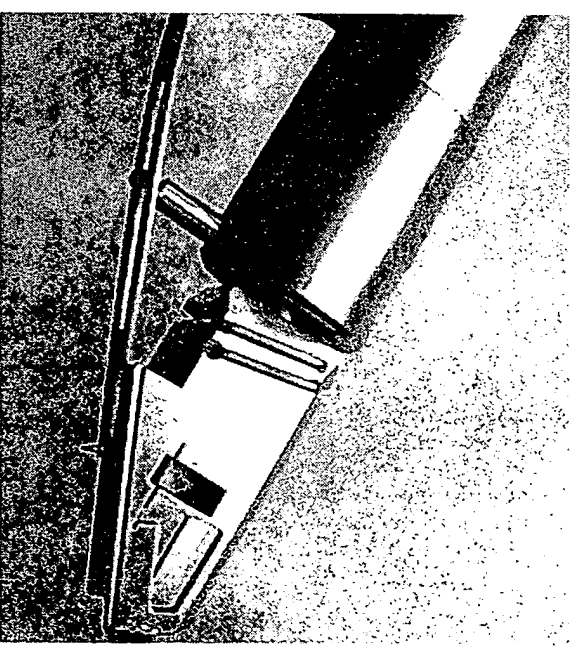
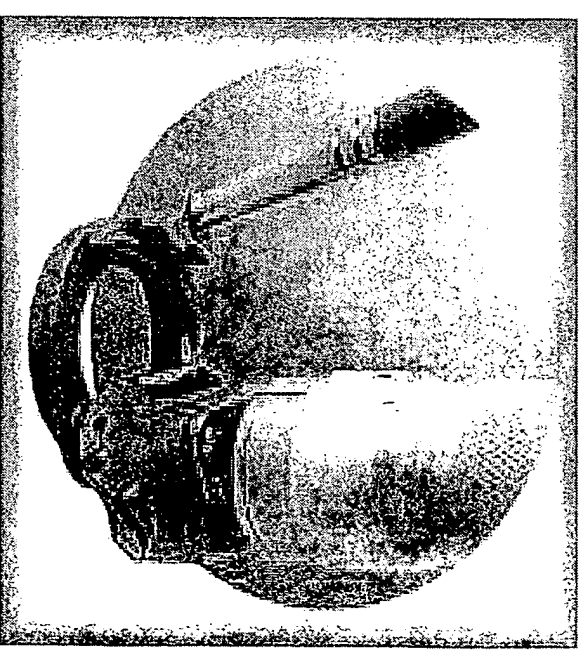
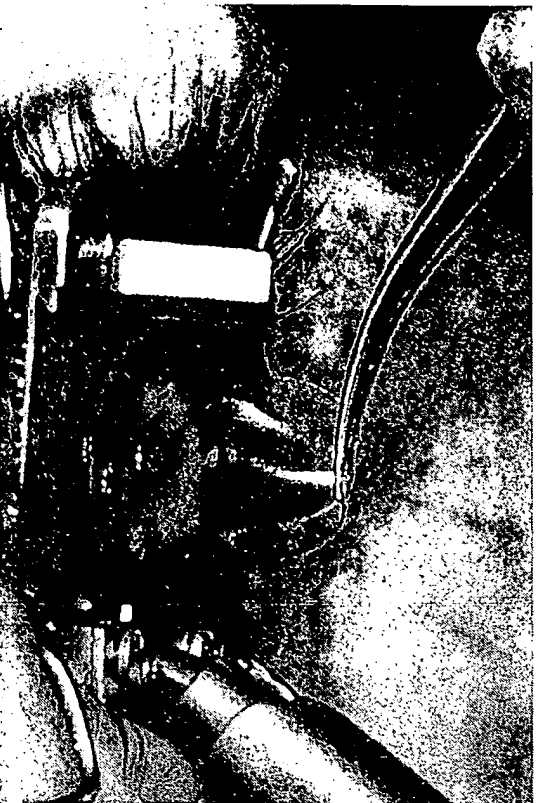


- pain
- visual rehabilitation
- haze

Laser in situ Keratomileusis (LASIK)

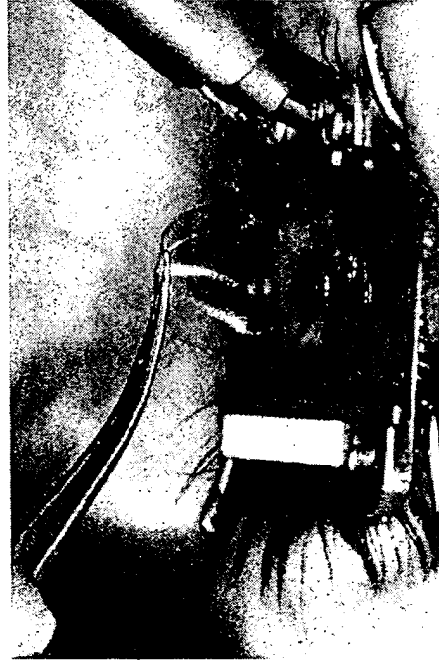
disadvantage:

- microkeratome



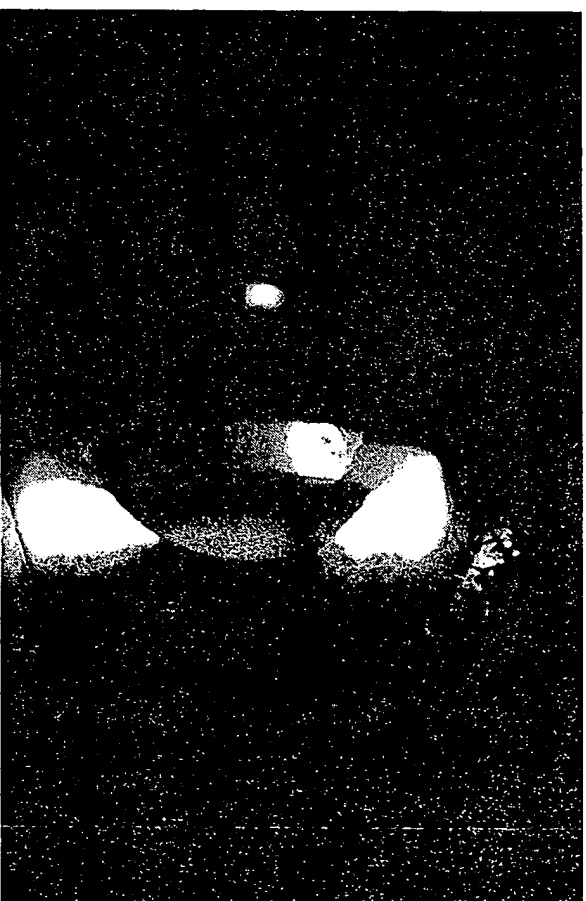
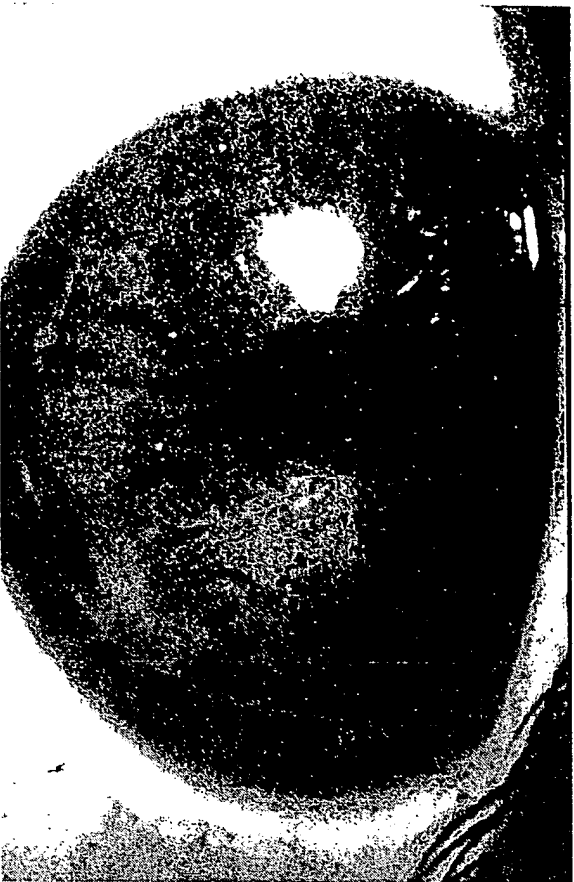
microkeratome variability

(K. Salomon, ASCRS 2002)

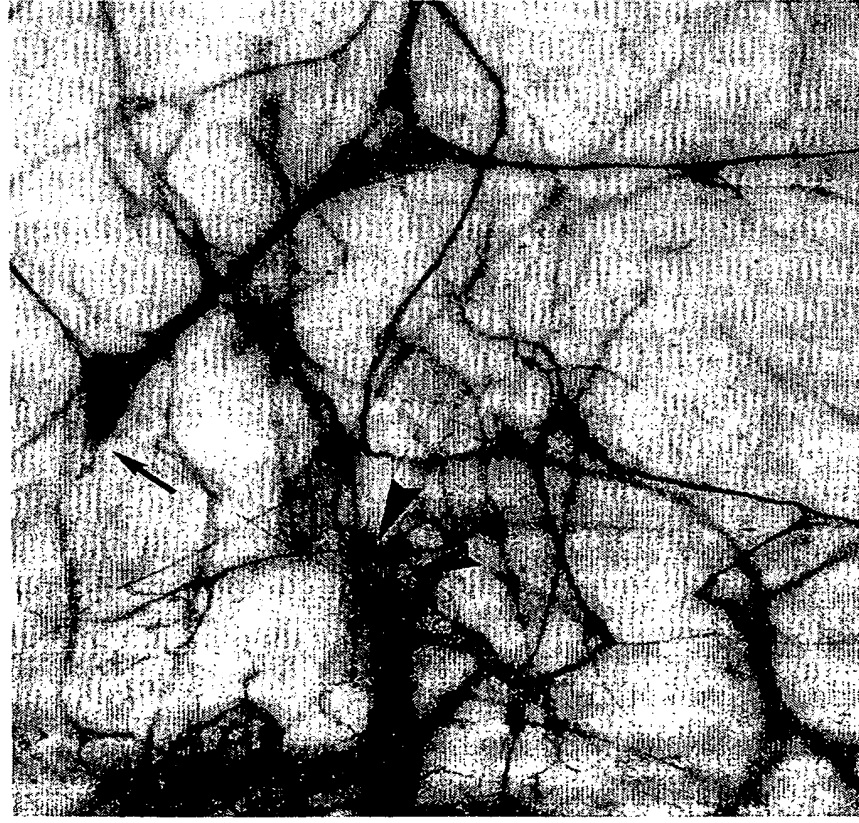


| | |
|-----------------|-------------------------|
| Amadeus (140) | 100 – 180 μm |
| Amadeus (160) | 110 – 250 μm |
| Hansatome (160) | 80 – 180 μm |
| Hansatome (180) | 80 – 180 μm |
| Moria (110) | 110 – 220 μm |
| Moria (130) | 140 – 240 μm |
| Moria (150) | 160 – 250 μm |

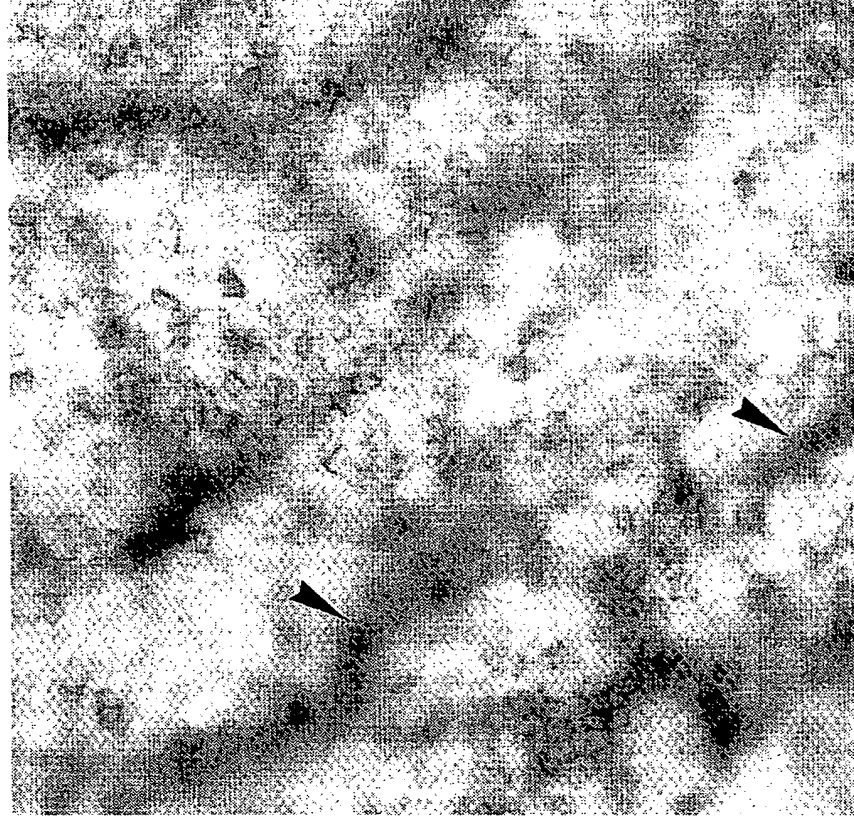
Epithelial ingrowth, Infections and DLK



“Keratoconjunctivitis sicca”



pre LASIK



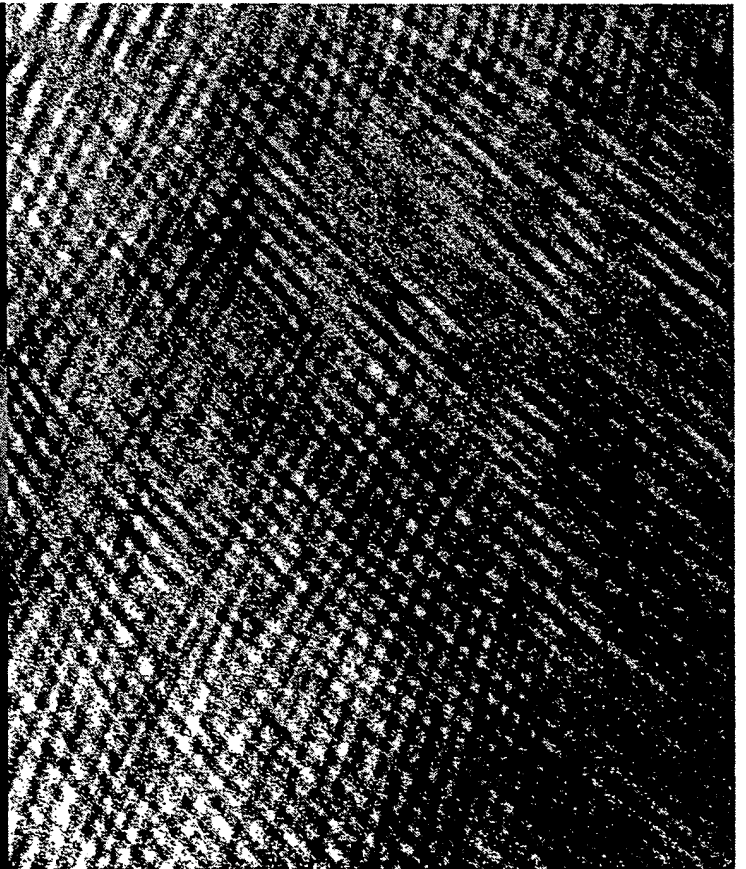
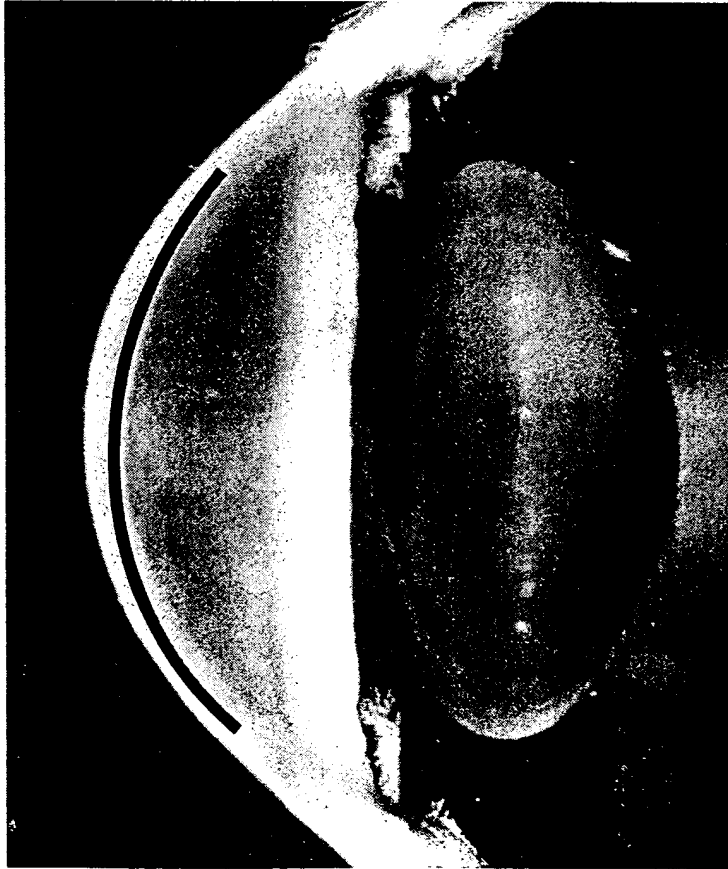
post LASIK

BPI

FLAP

BED

ENDO



50 μm - 120 μm

Superficial Deep

Lamellae

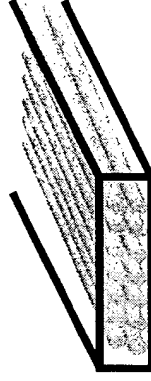
Lamellae

30 - 50 μm wide 100 - 200 μm wide
0.2 - 1.2 μm thick 1.0 - 2.5 μm thick

30-50 μm

Superficial

66,640 fibres

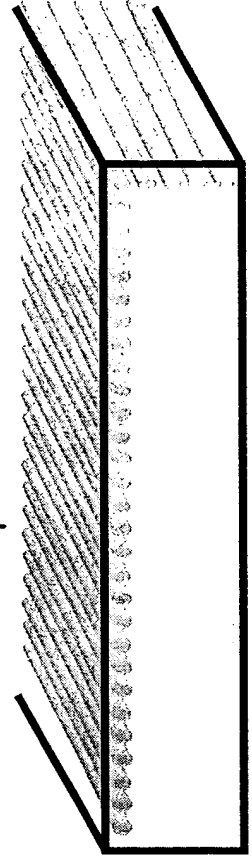


0.2 -
1.2 μm

Deep

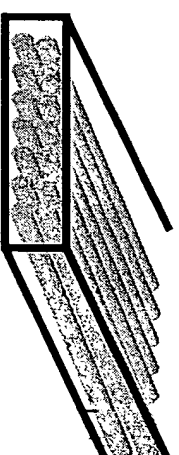
553,000 fibres

100-200 μm



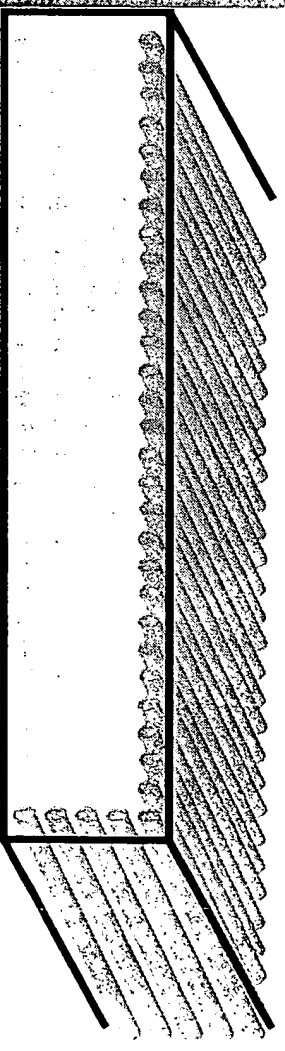
1.0 -
2.5 μm

PRK & LASEK

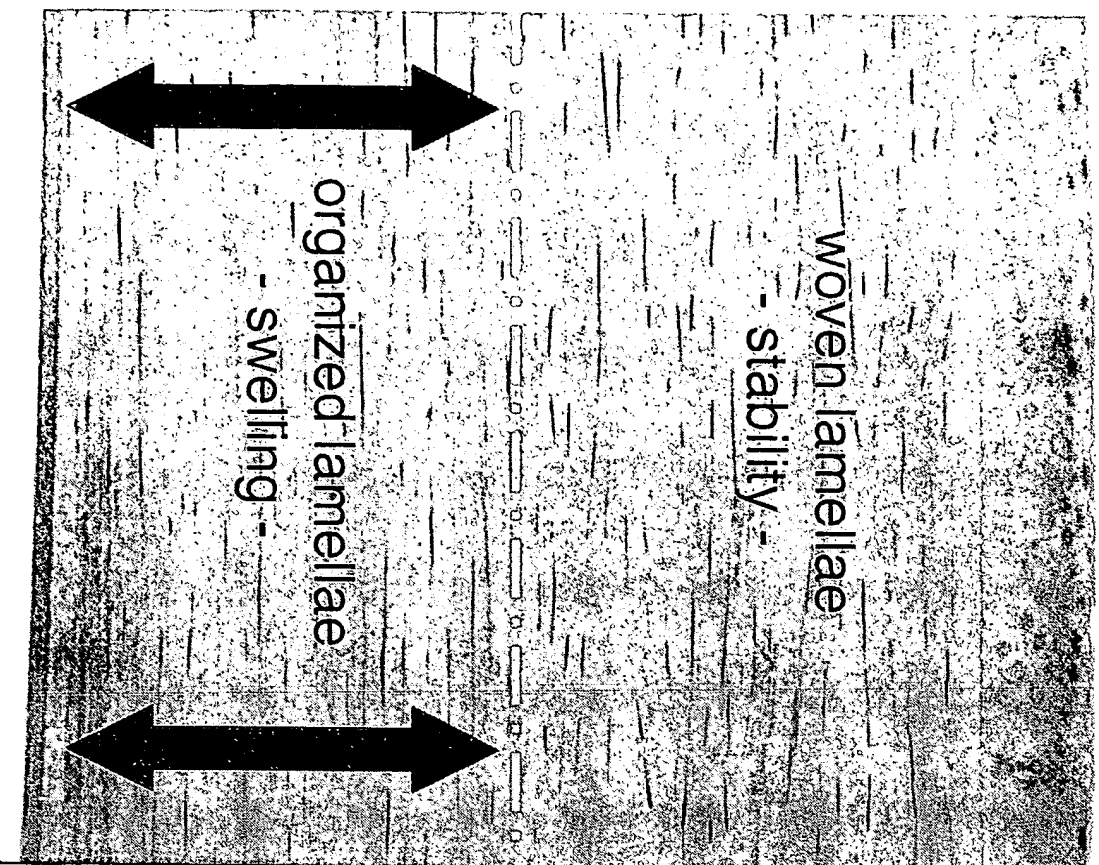


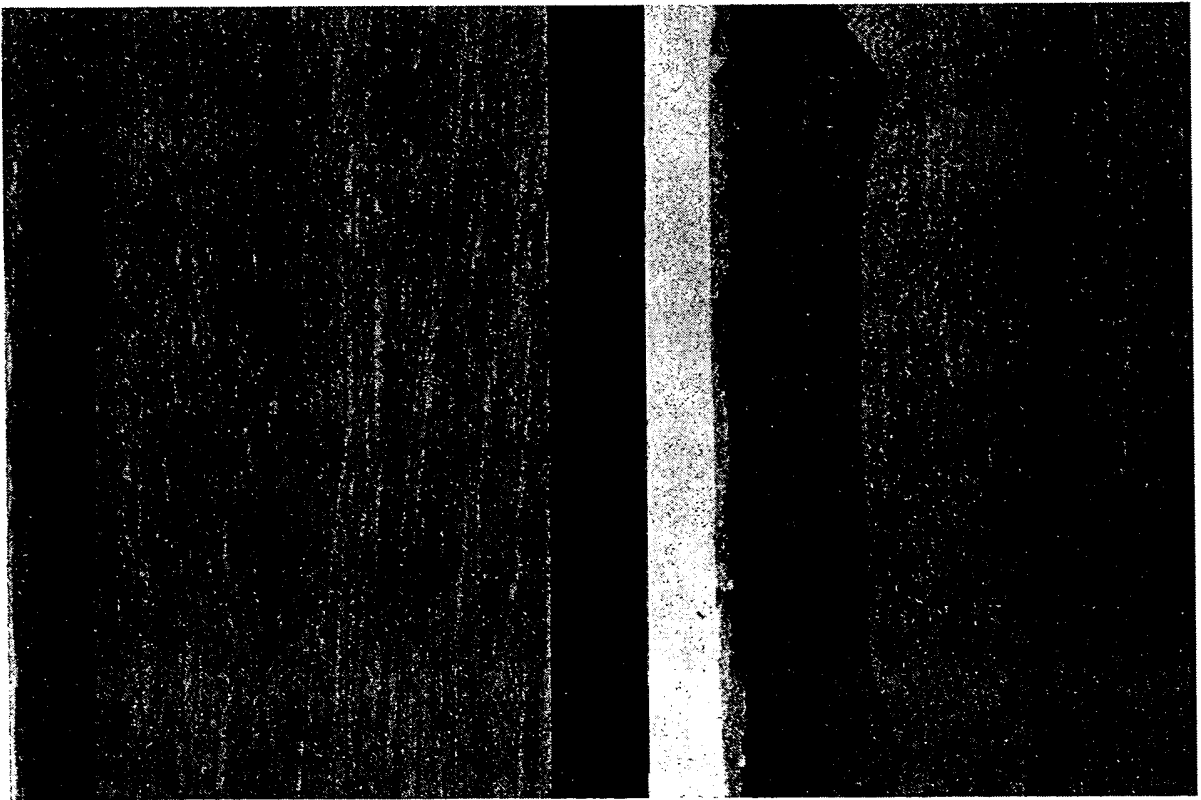
5,331,200

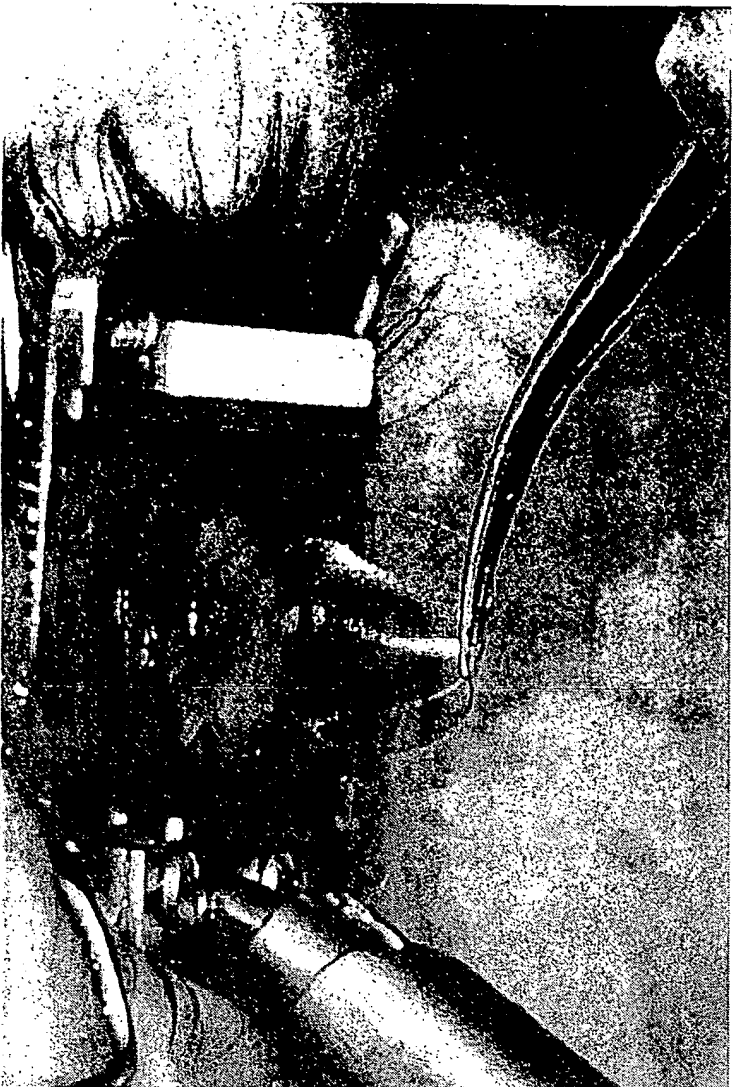
LASIK



232,260,000





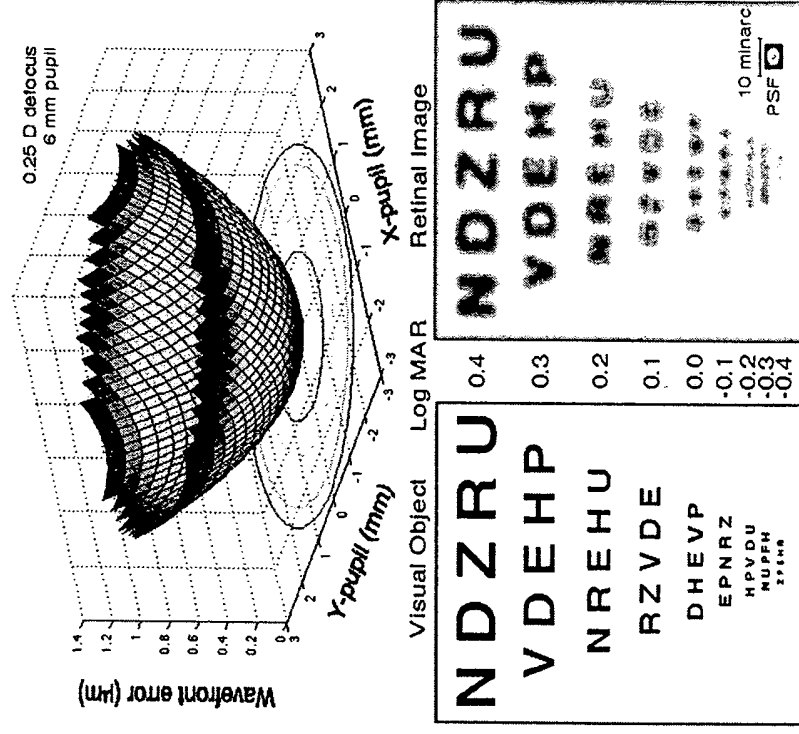


LASIK

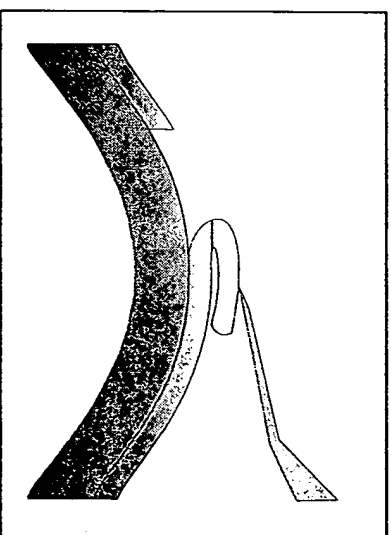
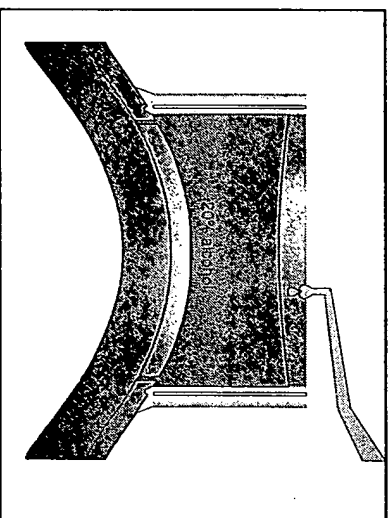
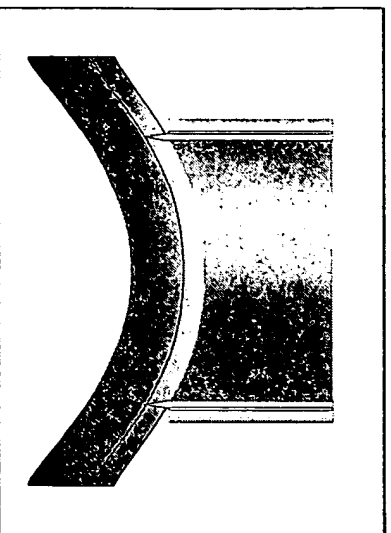
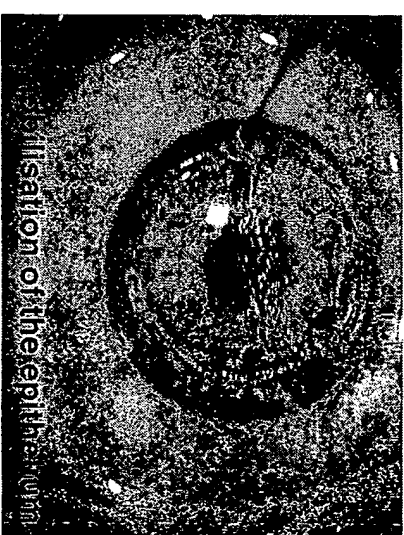
Wow-Effekt!



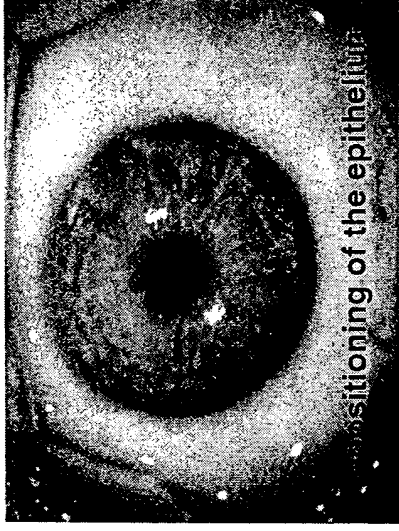
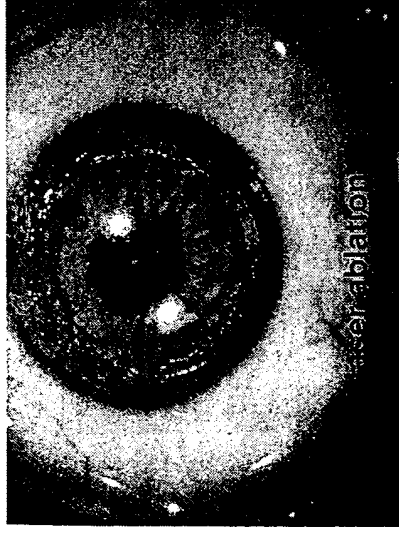
Measurement of Flap Induced Ocular Aberrations



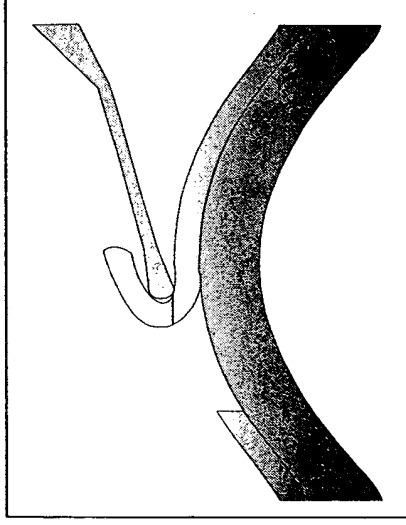
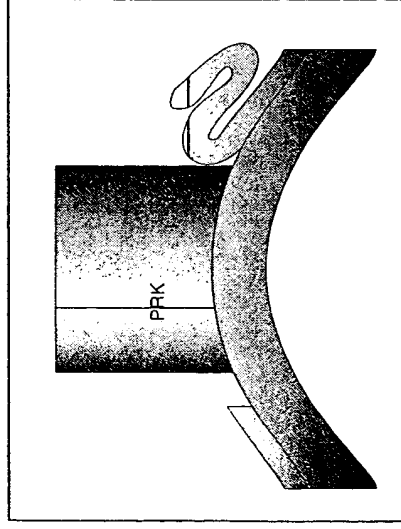
Laser Epithelial Keratomileusis (LASEK)



Laser Epithelial Keratomileusis (LASEK)



advantages
of PRK and LASIK
without
their disadvantages

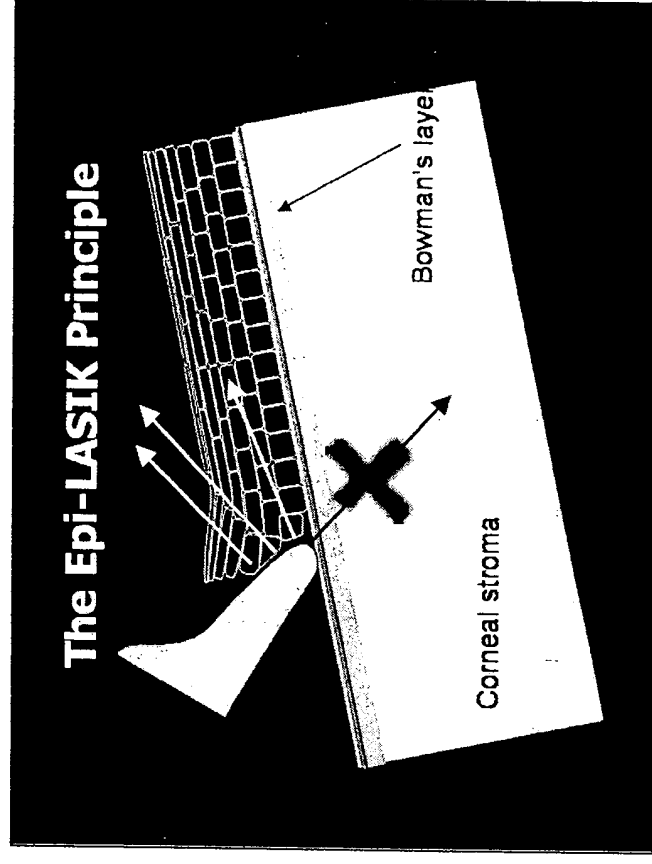


Epi – LASIK with Norwood Abbey SES



Epi-LASIK Technique

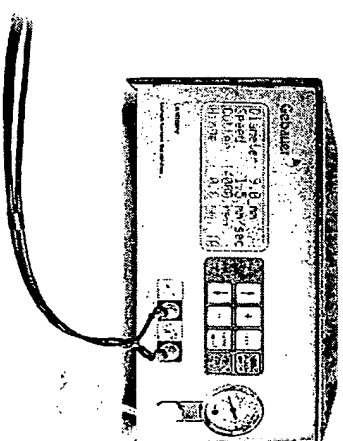
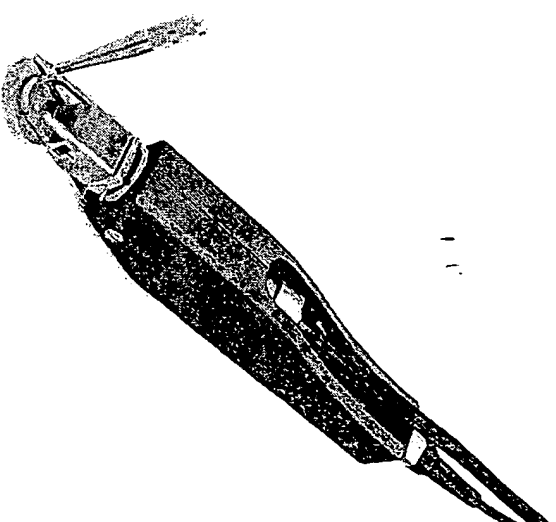
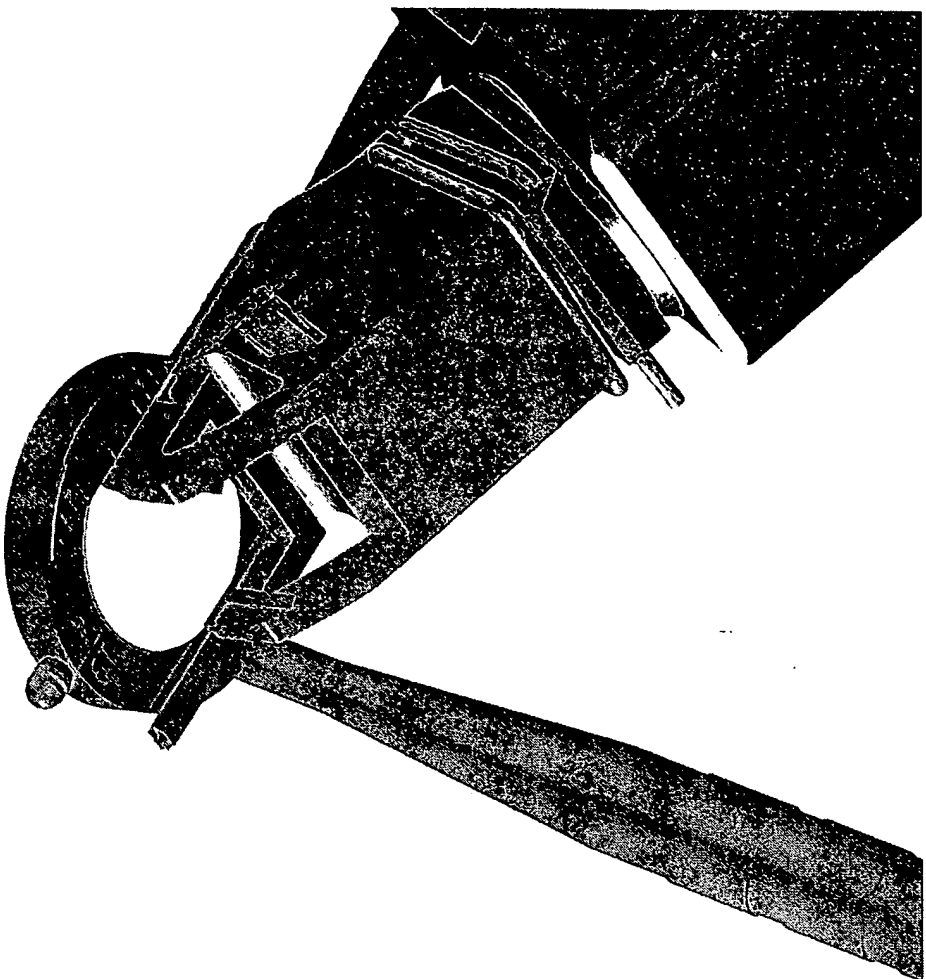
- Pallikaris et al*
- Epithelial flap
- Cleavage principle
- No alcohol



* Pallikaris, IG et al. Epi-LASIK: Comparative histological evaluation of mechanical and Alcohol-assisted epithelial separation. *J Cataract Refract Surg* 2003; 29:1496-1501

Epi-Lasik / LASEK without alcohol

- Gebauer Epitome -

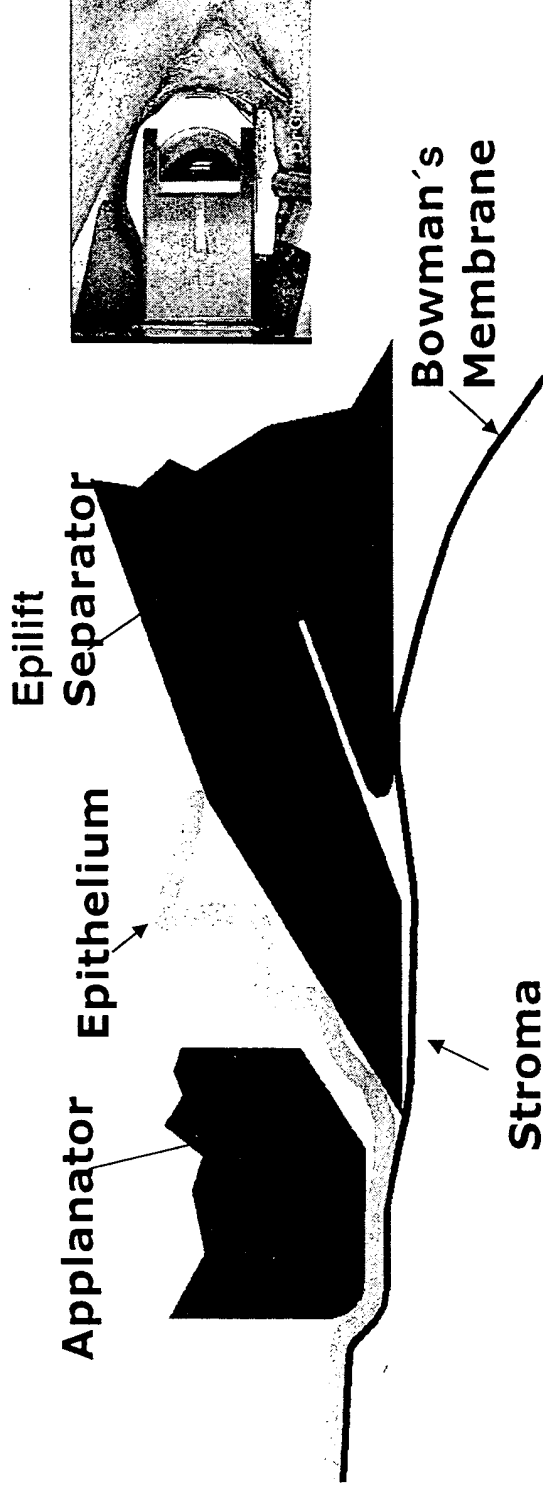


Epi-Lasik / LASEK without alcohol



- Gebauer Epitome -

How does the Gebauer System work ?



- The applanator "flattens" the cornea in advance of the edge of the Epilift's edge.
- The distance between the applanation bar and the SurEdge is fixed (160 microns). Therefore, the Epithelial anatomy is consistently delivered in optimal alignment for separation.
- The Epilift has a downward force blade angle (top) and an upward force angle (bottom) which assures a pathway of separation parallel to & on top of Bowman's membrane.

Nomogram for EPI ring size

Use Standard Settings for Epi-Lasik / LASEK with Lasitome

table 1:

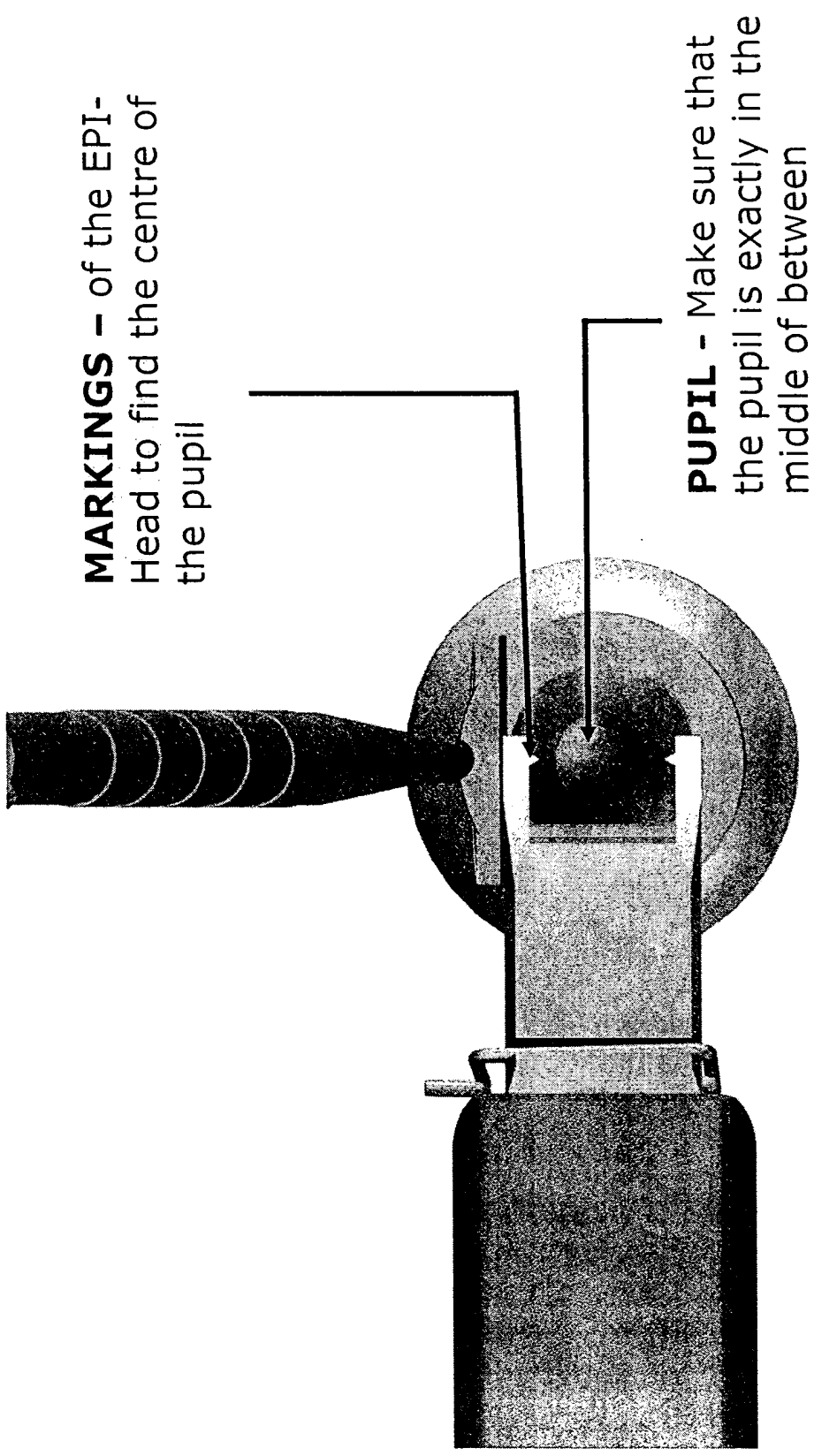
| | |
|-----------|---------------|
| Diameter: | 9.0 mm |
| Speed | 1.0 mm / sec. |
| | |
| Hinge | 0.5 mm |

table 2:

| FLAP-DIAMETER expected | 8.0 - 8.5 mm (set:8.0 mm) | 8.5 - 9.0 mm (set:8.5 mm) | 9.0 - 9.5 mm (set:9.0 mm) | 9.5 - 10.0 mm (set:9.5 mm) | 10.0 - 10.5 mm (set:10.0 mm) |
|---------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|---------------------------------|
| K-READING | | | | | |
| 37 dpt | EPI-Head 19/4 or 21/4 Ring | EPI-Head 19/3 or 21/3 Ring | --- | --- | --- |
| 40 dpt. | --- | EPI-Head 19/4 or 21/4 Ring | EPI-Head 19/3 or 21/3 Ring | --- | --- |
| 43 dpt. | --- | --- | EPI-Head 19/4 or 21/4 Ring | EPI-Head 19/3 or 21/3 Ring | --- |
| 46 dpt | --- | --- | --- | EPI-Head 19/4 or 21/4 Ring | EPI-Head 19/3 or 21/3 Ring |

Note: In case of K-reading < 40 dpt. or in case of wavefront guided ablation use the recommended Diameter setting in table 2.

Anatomical attachment of EPI head



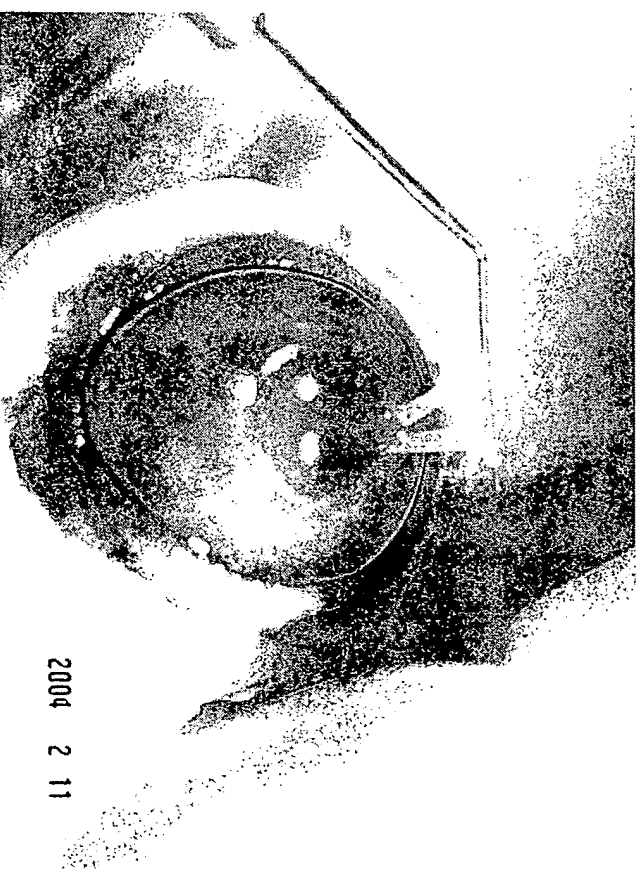
Lasitome: Experimental studies

Purpose:

- Morphological analysis
- Establish safe parameters

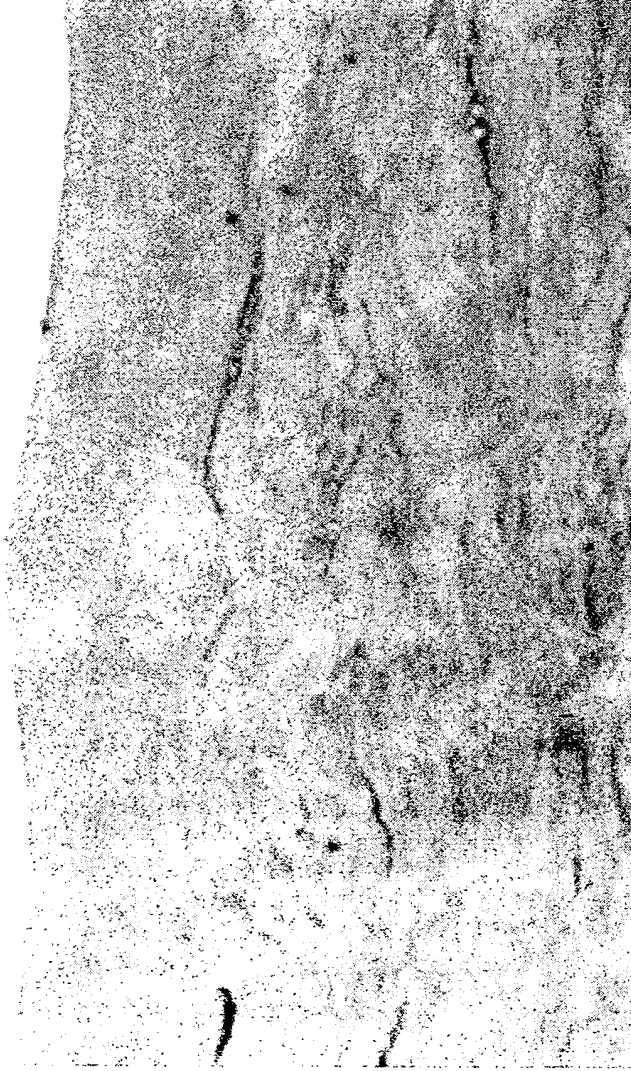
Methods

- Porcine corneas
- Human corneas (Eye banks)



Epi-Lasik / LASEK without alcohol

- Gebauer Epitome – Chris P. Lohmann

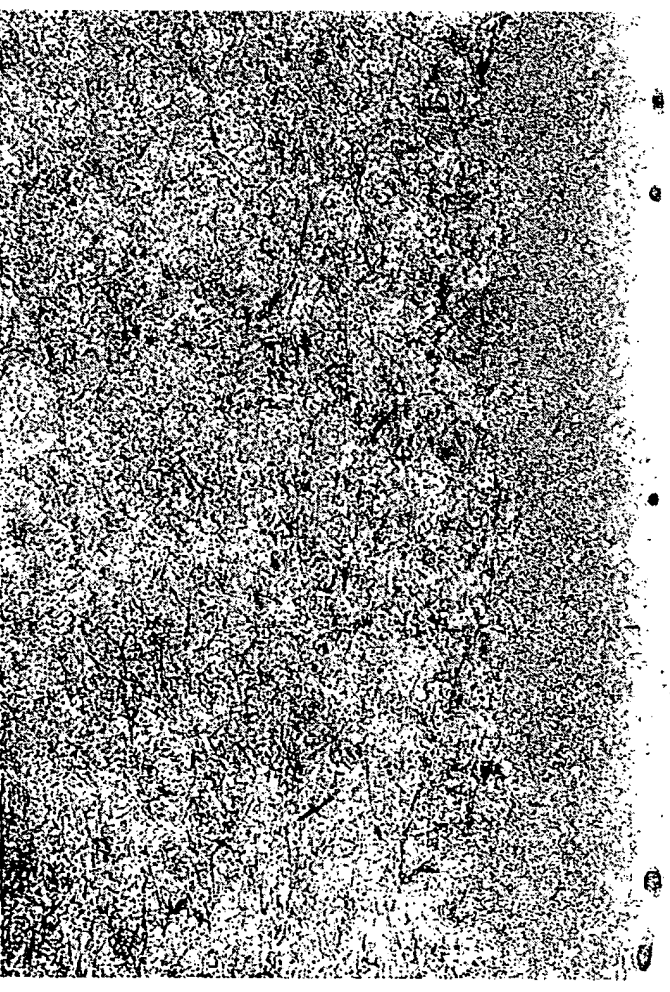
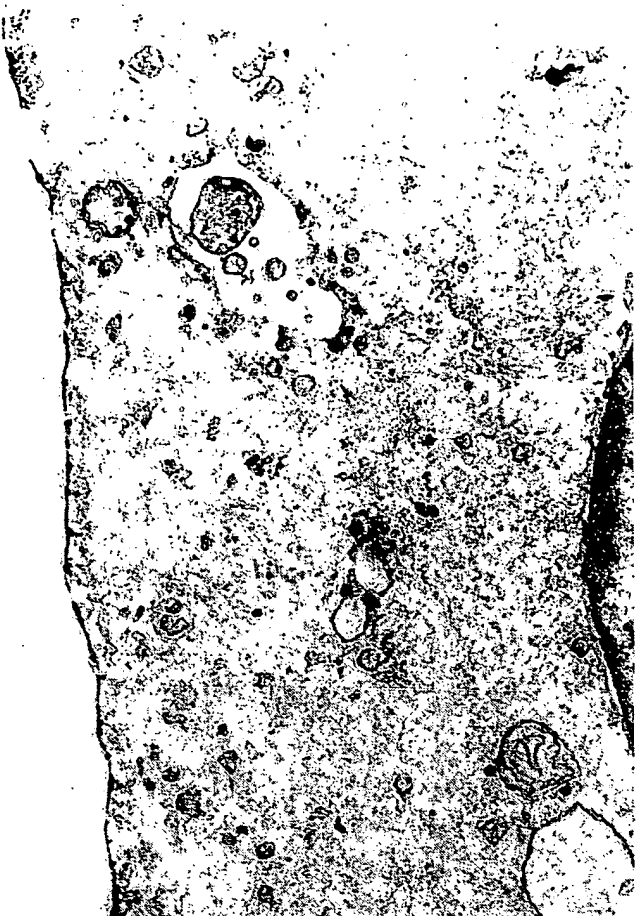


Lightmicroscopy:

- sharp cut at the epithelium
- very smooth surface
- no damage to Bowman's layer

Epi-Lasik / LASEK without alcohol

- Gebauer Epitome – Chris P. Lohmann



Electronmicroscopy:

- no damage to epithelial cells
- intact basalmembrane
- smooth Bowman's surface

Epi-LASIK: Morphology

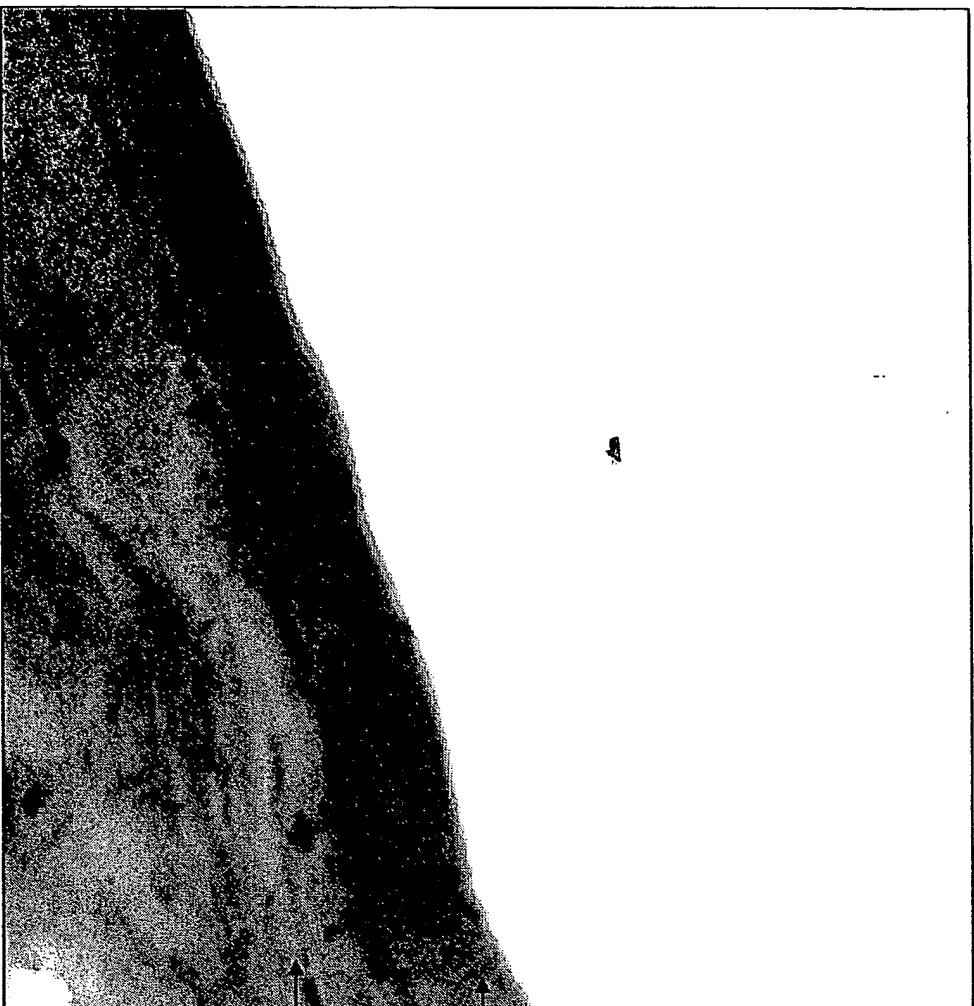
Marcello Netto, Cleveland



■ Flap integrity

Stromal Integrity

Marcello Netto, Cleveland



Bowman's layer

Anterior stroma

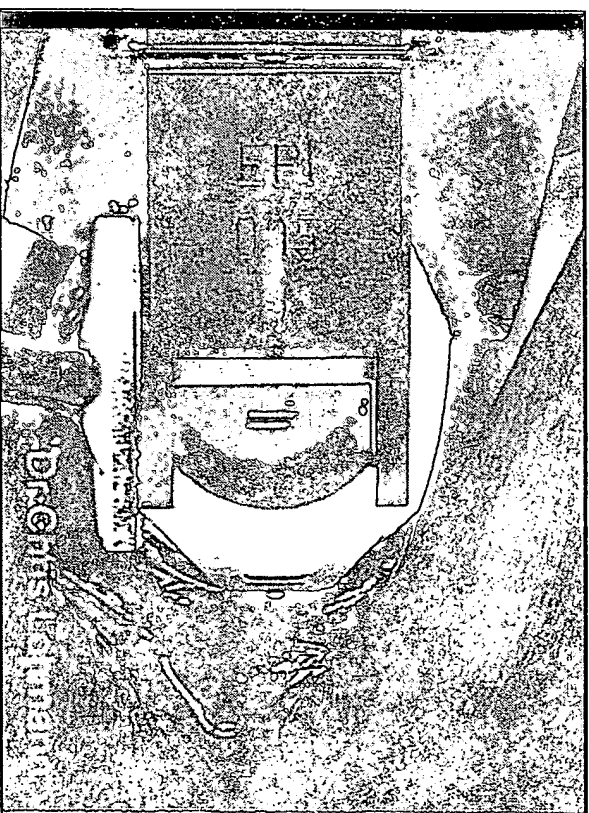
Epi-LASIK: Morphological findings

Marcello Netto, Cleveland

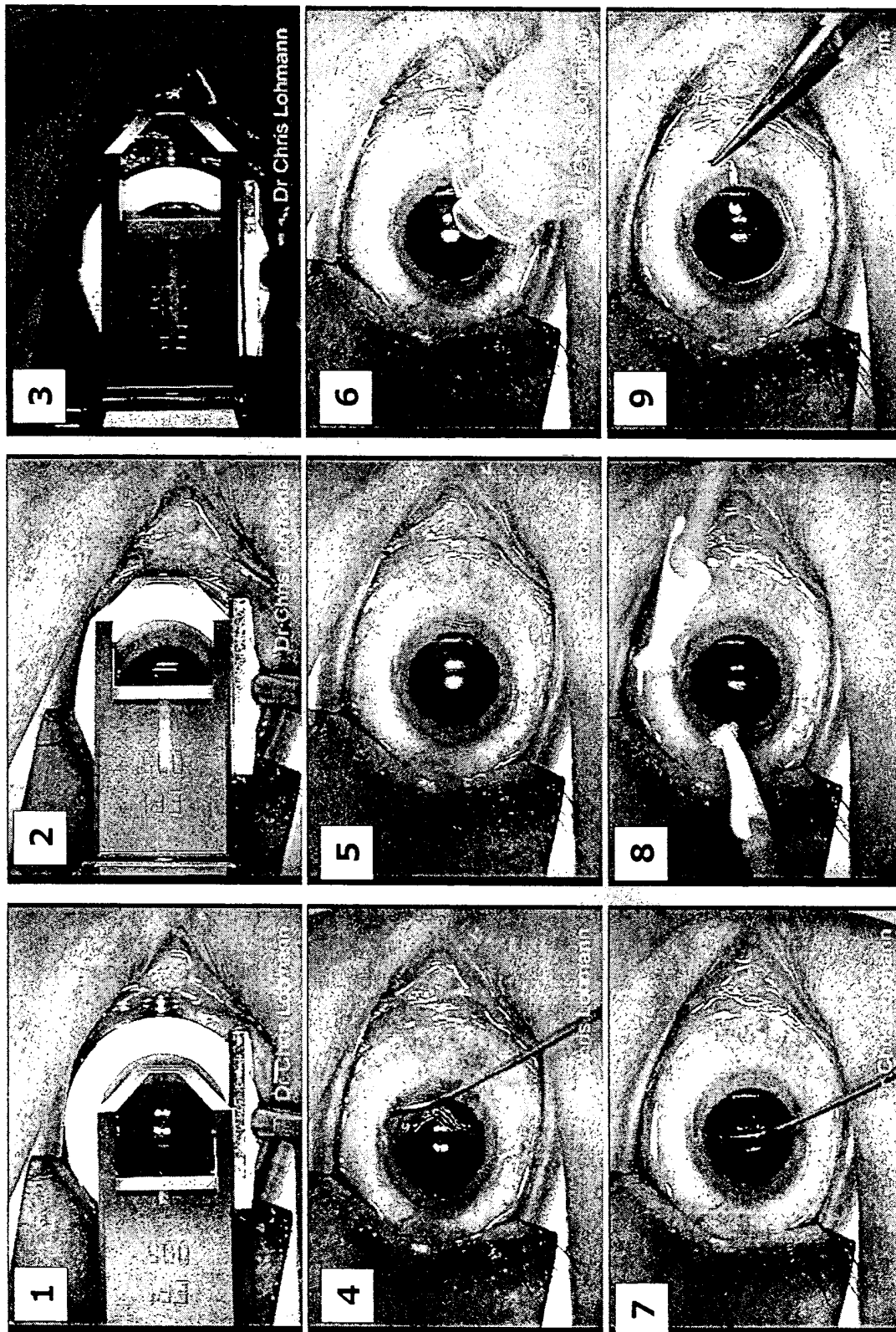
- Epithelial flap integrity
- Stromal integrity
- Intact intercellular adhesion
- Intact intracellular contents
- Micro-focal disruptions at the basement membrane

Present experience

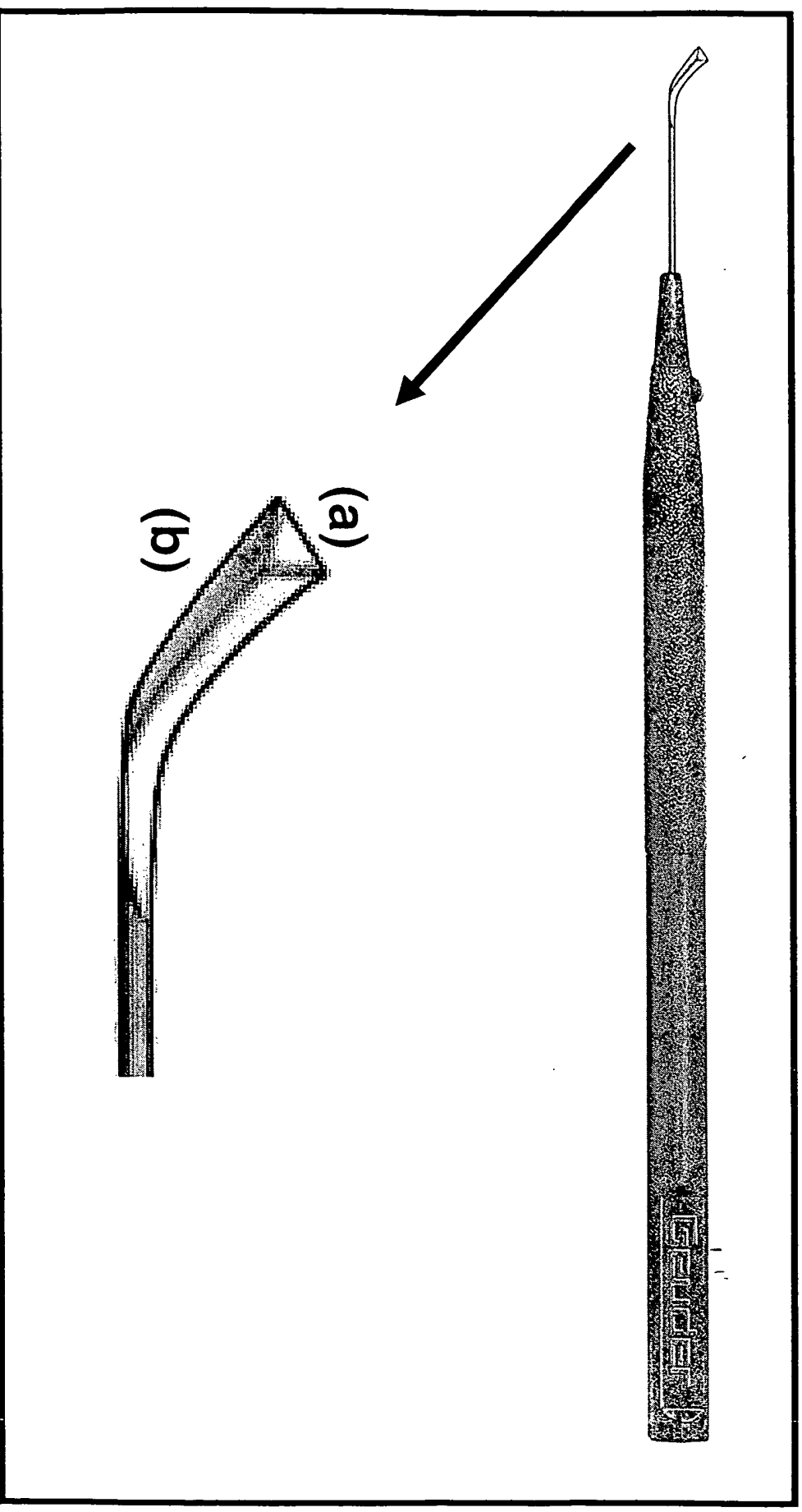
- No FDA approval
- European experience
- US: experimental studies



Epi-Lasik / LASEK without alcohol



Epi-peeler (Geuder, Germany; www.geuder.de)



Epi-Lasik / LASEK without alcohol

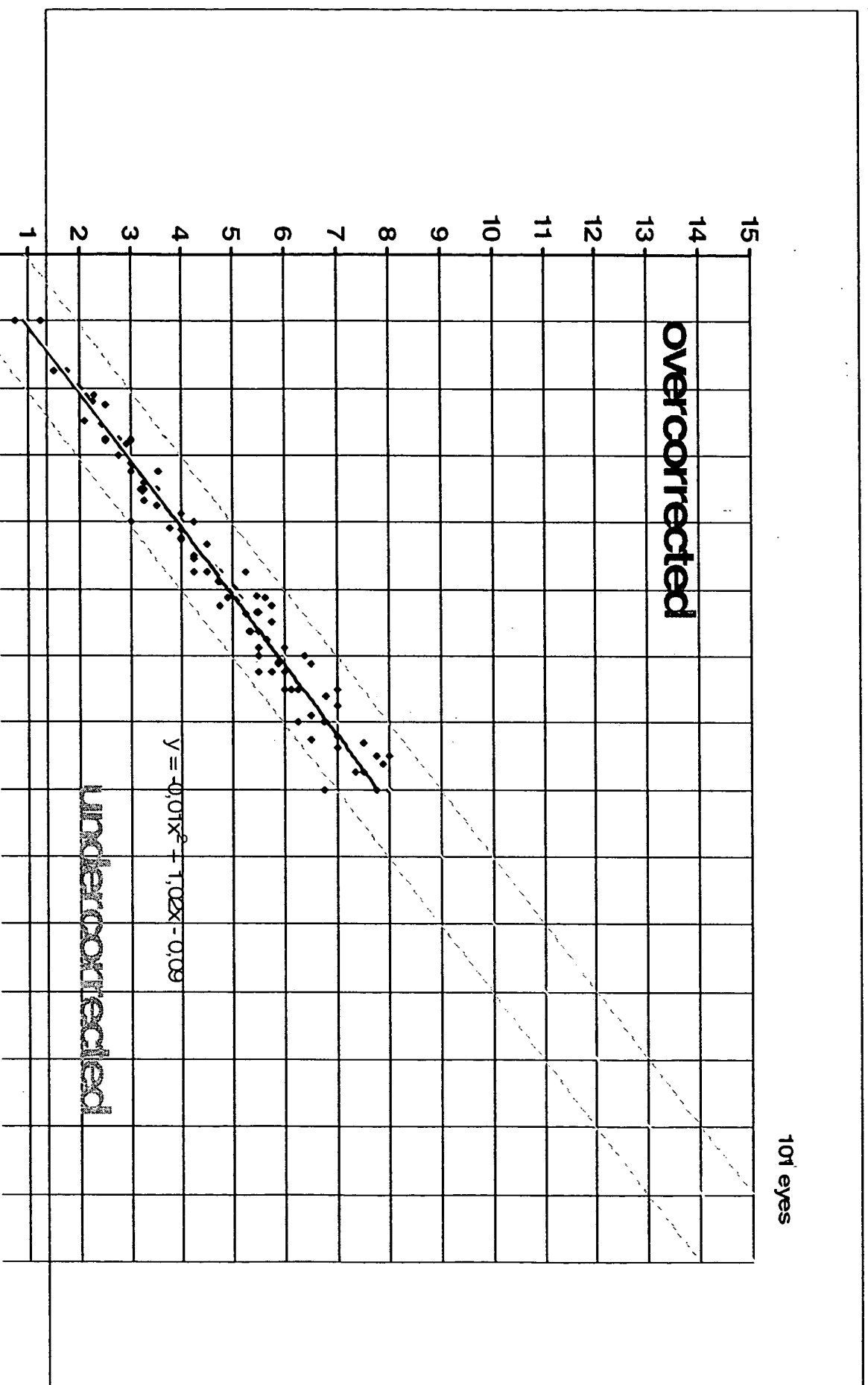
- Gebauer Epitome – Chris P. Lohmann

my clinical experience:

- 243 myopic and astigmatic eyes (-1.25 to - 8.0 D)
- no flap problems
- no intraoperative pain
- no intraoperative "light out"
- contact lens removal after (1) or 2 or 3 days

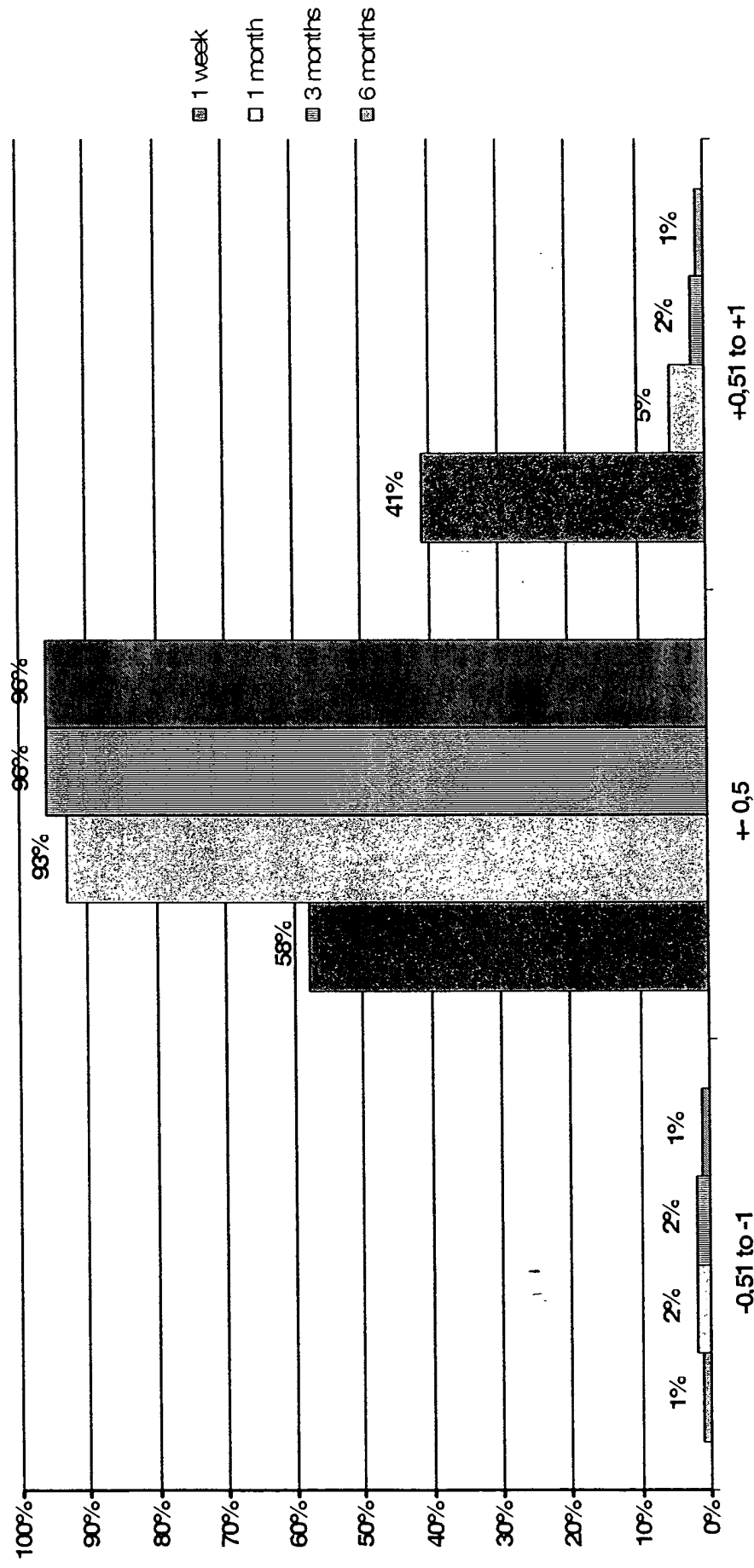
Epi-Lasik / LASEK without alcohol

- Gebauer Epitome -

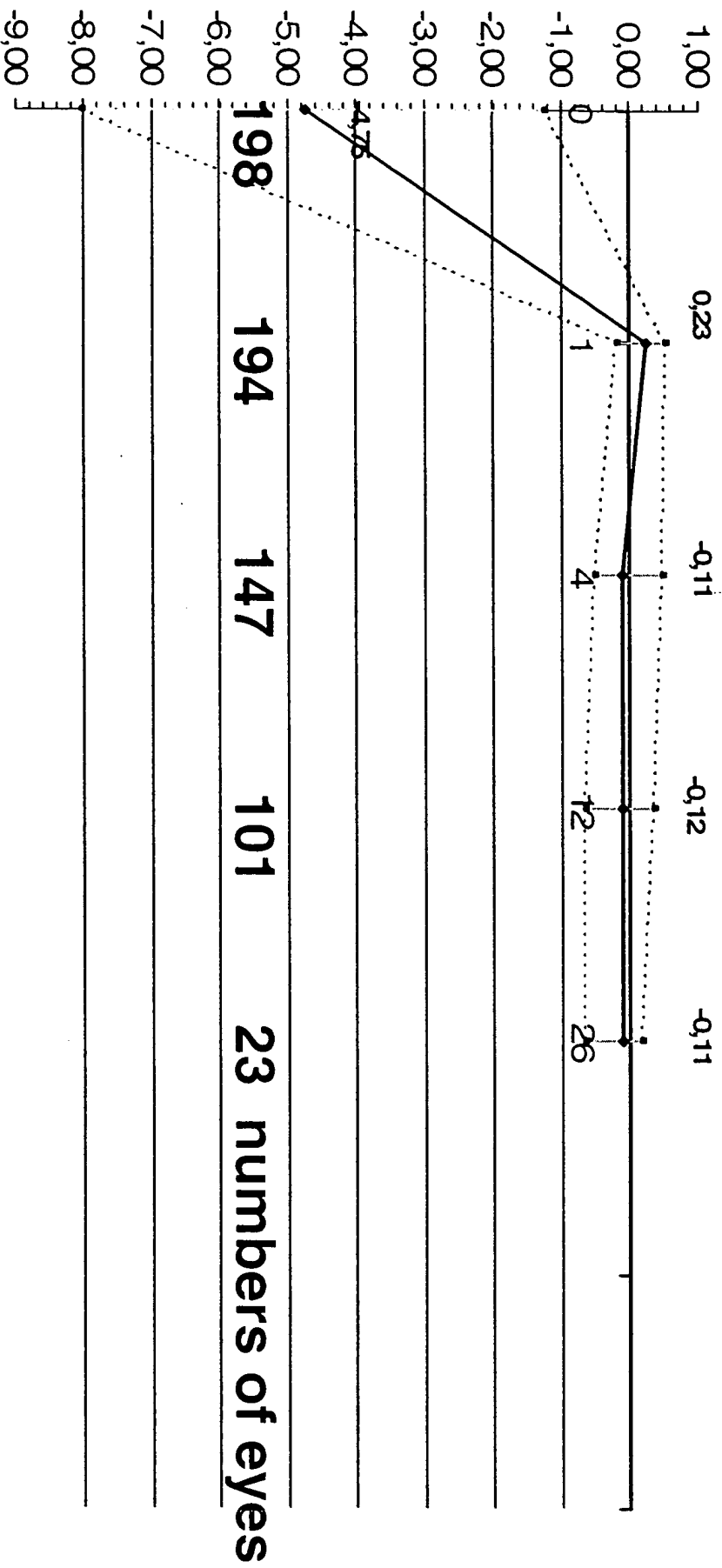


Epi-Lasik / LASEK without alcohol

- Gebauer Epitome -



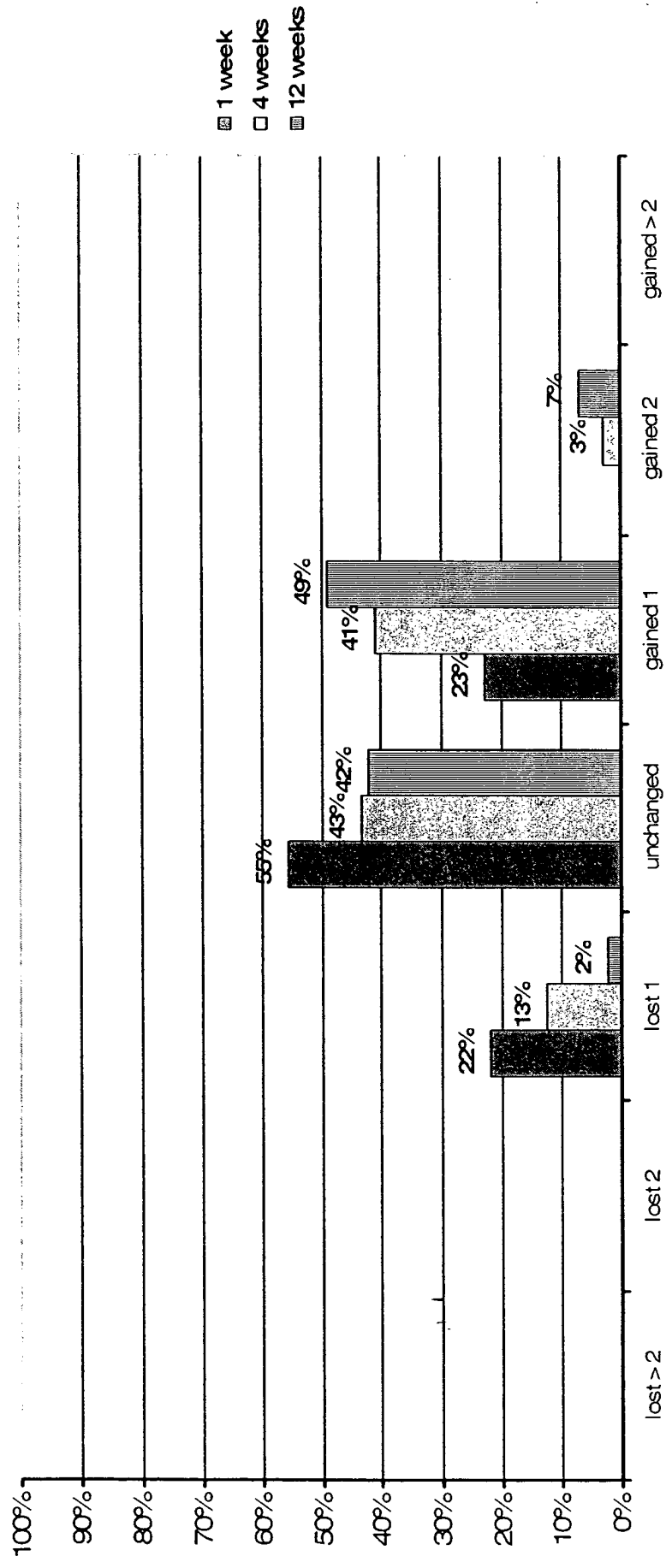
Epi-Lasik / LASEK without alcohol - Gebauer Epitome -



STABILITY: Achieved Change in Refr. over Time (weeks)

Epi-Lasik / LASEK without alcohol

- Gebauer Epitome -

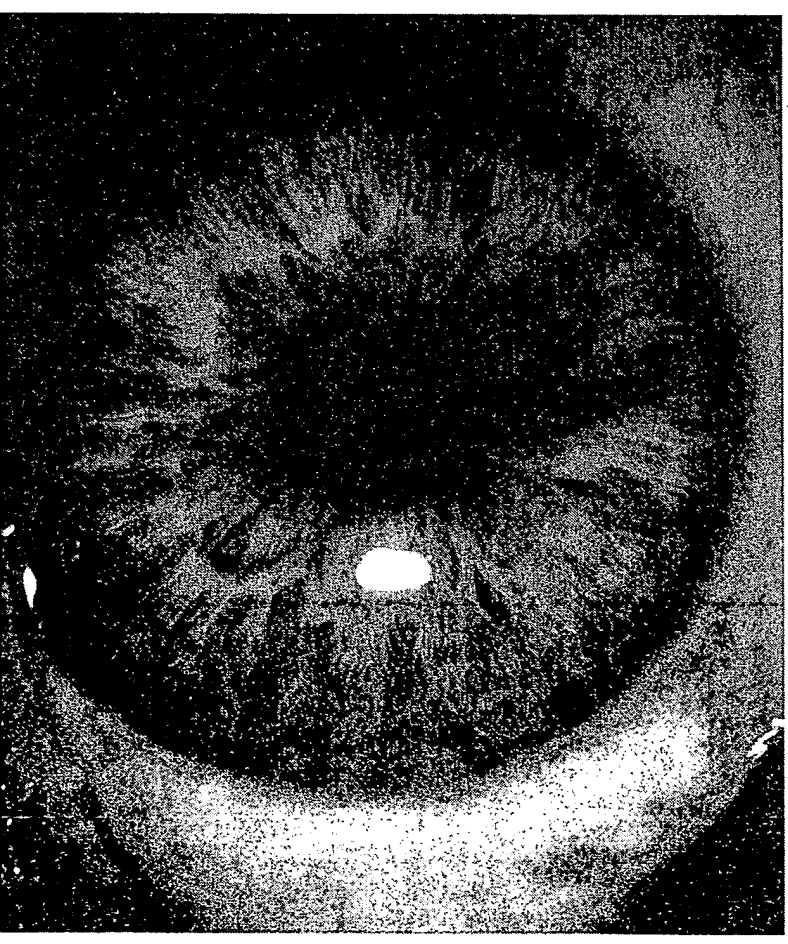


SAFETY: Change in BSCVA - Percentage

Epi-Lasik / LASEK without alcohol -
Gebauer Epi-Tome - Chris P. Lohmann



- 1 day postop
- no contact lens anymore
- VA: 20/15



- 2 days postop
- VA: 20/20 +

Conclusions

- Effective
- Reproducible => consistent epi-flap
- Safe
- Future studies
- Larger experience

Surgical technique - Pearls

Recommended by Dr. C.P. Lohmann

- After laser treatment:
 - Wash wound bed thoroughly with BSS
 - Completely dry around wound bed especially hinge area
 - Replace EPI flap
 - Dry surface of flap and surrounding tissue before applying BCL
 - Using swab, press gently on surface of BCL to ensure all excess fluid is expressed from under the lens

MEDICATION / TREATMENT

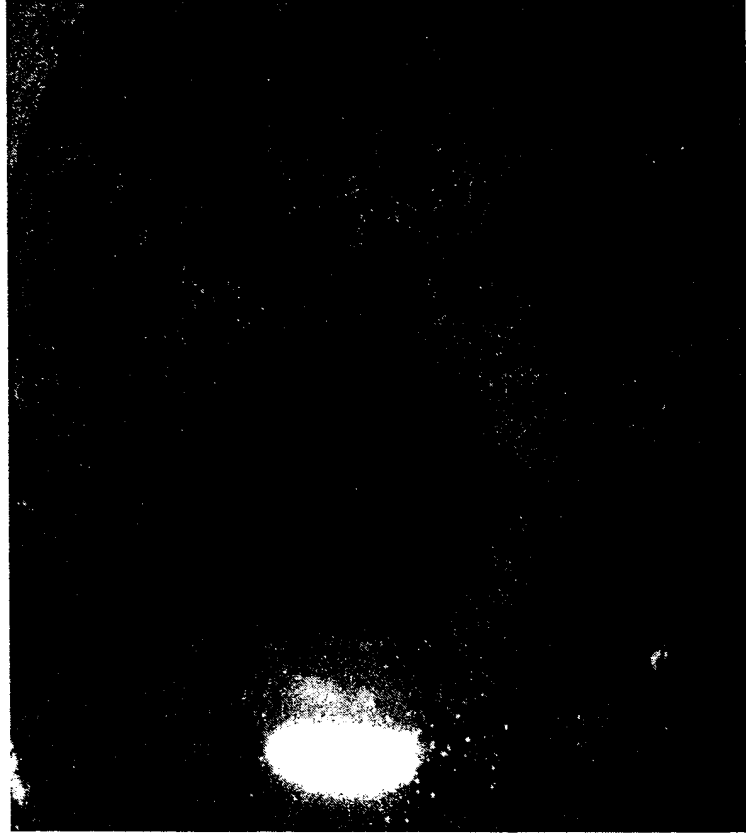
(PRE, INTRA & POST-OP)

- **Pre-op** (before entering OR
 - ??
- **Pre-op (on table)**
 - Two (2) drops mepivacaine (or equivalent) to operative eye with 2 minute interval between both
 - NEVER use Tetracaine - can loosen epithelium
- **Post-op** (Same regimen as used for LASEK)
 - Provide patient with
 - small amount Voltaren for pain or discomfort during first 24 hrs
 - Non-preservative topical antibiotic (Kombistullin)
 - Non-preservative topical steroid drops (dexamethasone) 4x/day for 2 weeks and then 2x/day for further 2 weeks
 - Non-preservative artificial tears (carbomer) 4x/day for 4 weeks

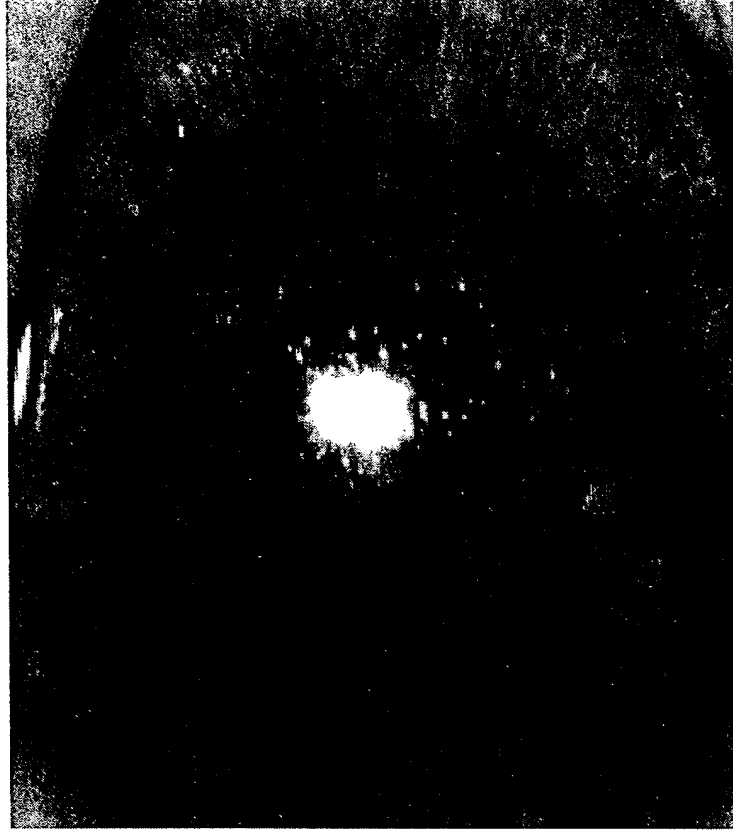
POST-OP CARE

- **15 - 30 mins post-op**
 - Observe at slit lamp that BCL is properly positioned and that the epithelial sheet is stationary and has not moved
- **BCL**
 - Currently Biometric 55 with BC of 8.9 is recommended

1 day post op Epi-LASIK Gebauer Epitome



**Biomedics 55 contact lens
BC 8.9
VA 20/20 uncorrected**



**B&L PureVision contact lens
BC 8.6
VA 20/40 uncorrected**

Post-op Examination

Day one

- At slit lamp, look for oedema
- Apply topical anaesthetic drops
- Check stability of BCL by using a swab to try to gently move the BCL
- If no movement, remove BCL by holding at temporal edge and lifting in temporal direction (ie: away from the hinge)
- If unsure, leave for one more day

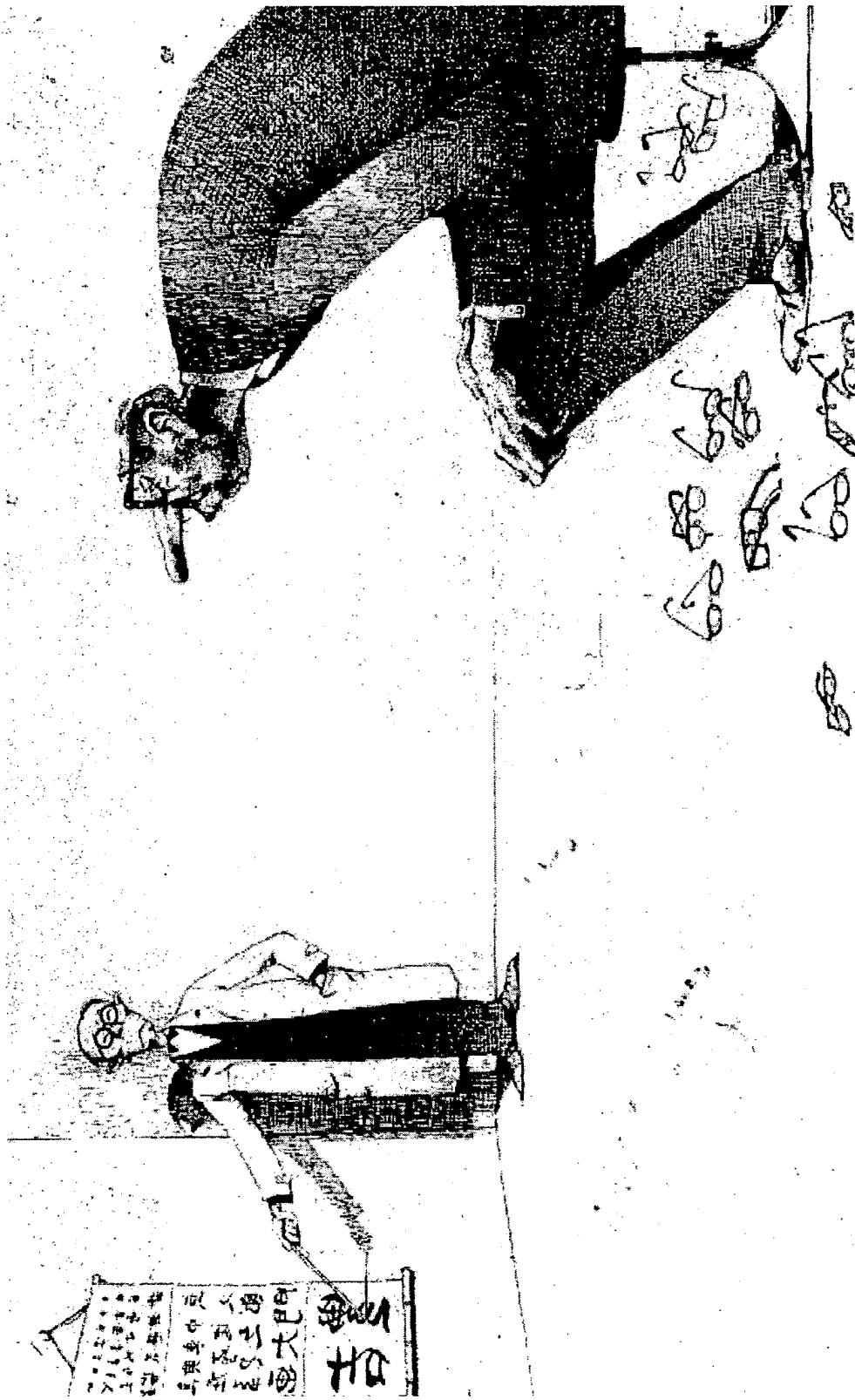
INTRA & POST-OP COMPLICATIONS

- **Inability to get suction even when unit shows vacuum attained**
 - If vacuum ring still mobile after max vacuum, check for trapped conjunctiva in aspiration hole on the ring
 - Try one more time only - if still a problem, change to 20mm ring ("high" vac ring)
- **"Incomplete flap"**
 - Often caused by deformed metal band (mishandling during assembly/disassembly)
 - Loss of suction during cut/dissection, usually due to incorrect angle of handpiece - too much upward or downward pressure exerted by user)
- **Conjunctiva "too allergic" (chemosis)**
 - Reschedule case and change medication
- **"Cant fit the vacuum ring"**
 - Check for "lid squeeze"
 - Use recommended speculum



important:

- perfect repositioning of the epithelium
- no fluid underneath BCL
- bandage contact lens
- carbomer artificial tears



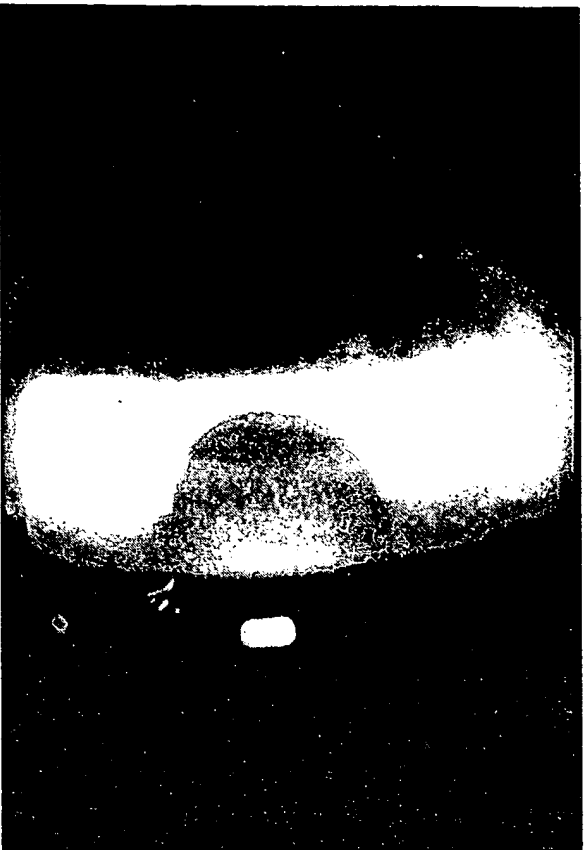
| | |
|-----------------|------------------------|
| 10 min post op: | 20/40 or better |
| day 1: | 20/30 (20/40 to 20/10) |
| day 3: | 20/40 (20/50 to 20/10) |
| day 6: | 20/20 (20/30 to 20/10) |

10 min post op: 20/40 or better

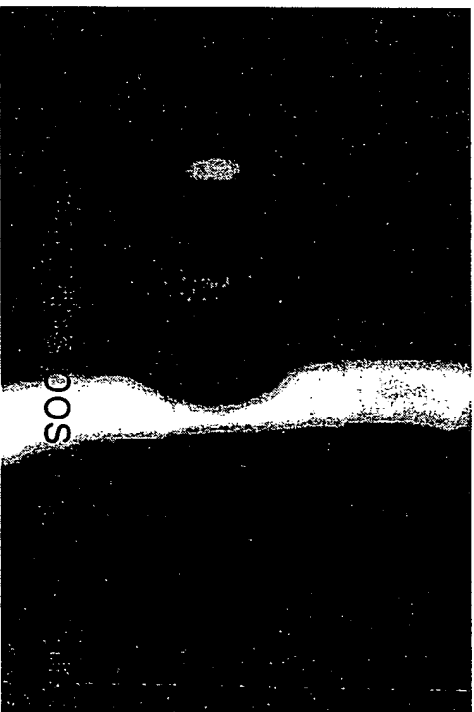
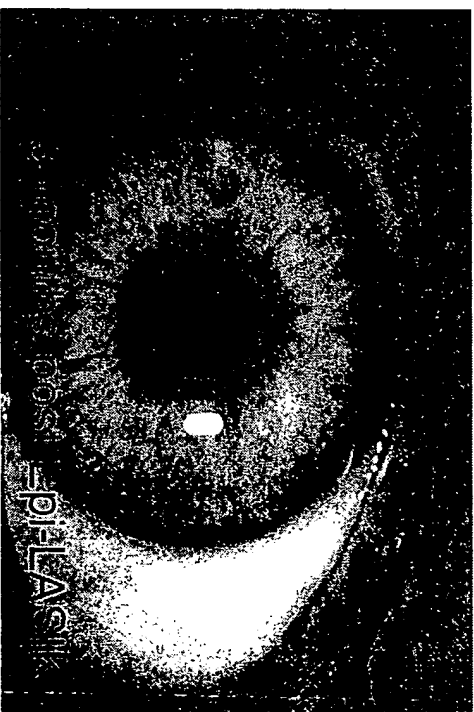
day 1: 20/30 (20/40 to 20/10)

day 3: 20/40 (20/50 to 20/10)

day 6: 20/20 (20/30 to 20/10)

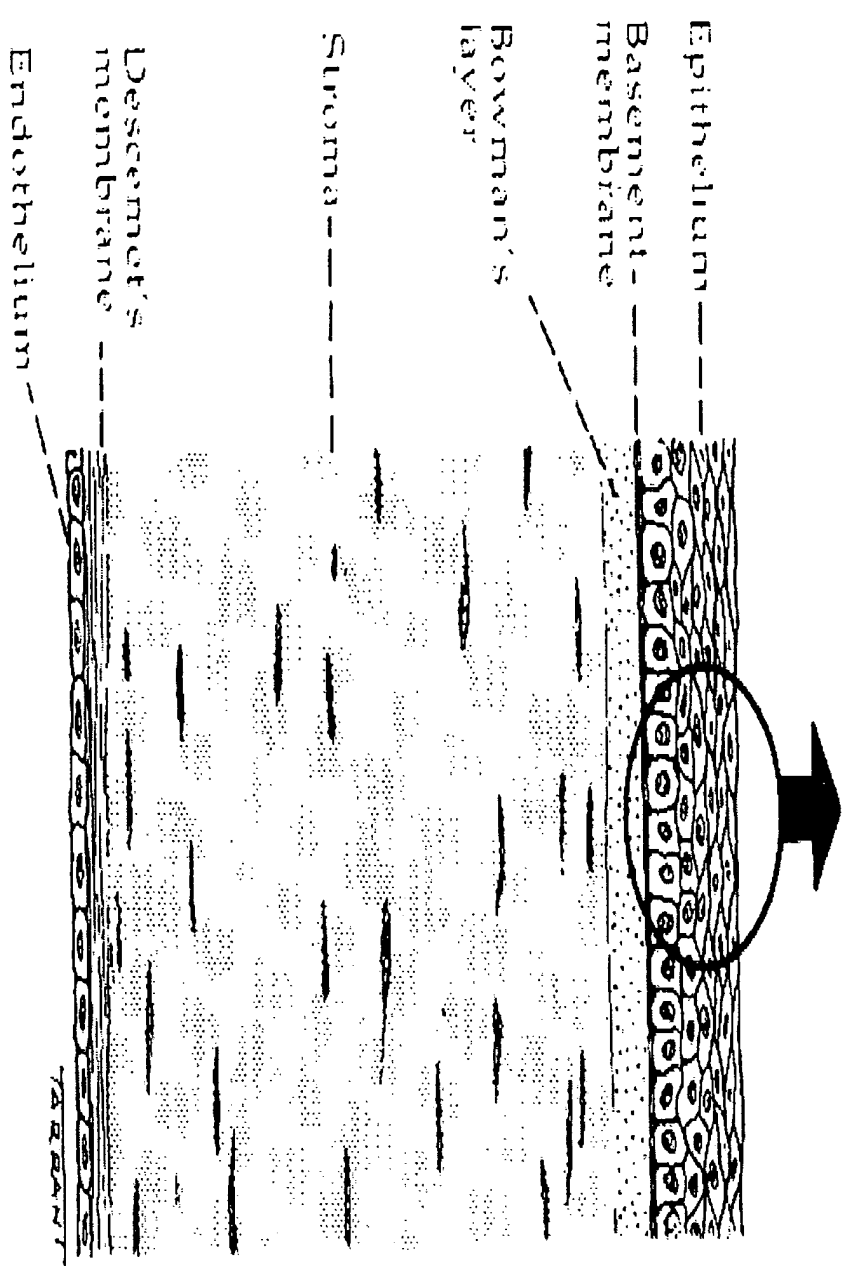
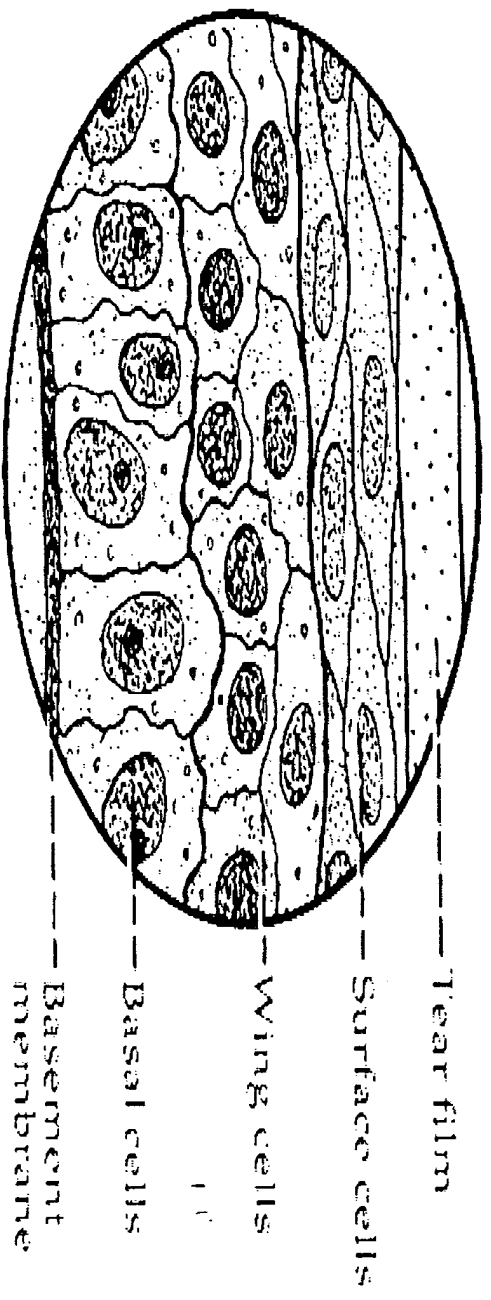


- ablation depth < 100 μm
- mitomycin C



Intraoperative corneal cooling with chilled BSS





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